AN

ABRIDGMENT

OF

MR. HEATH'S TRANSLATION

OF

BAUDELOCQUE'S

MIDWIFERY.

WITH NOTES,

BY WILLIAM P. DEWEES, M. D.
Lecturer on Midwifery in Philadelphia.

PHILADELPHIA:
Published by Thomas Dobson, at the Stone House, No. 41,
South Second Street.
Fry and Kammerer, Printers.
1811.

ANNEX
Gynecology

District of Pennsylvania, to wit:

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BE IT REMEMBERED, that on the twentieth day of November, in the thirty-first year of the independence of the United States of America, A. D 1807, Thomas Dobson, of the said district hath deposited in this office, the title of a book, the right whereof he claims as proprietor, in the words following, to wit:

"An Abridgment of Mr. Heath's Translation of Baudelocque's "Midwifery; with Notes, by William P. Dewees, M. D. Lec- "turer on Midwifery in Philadelphia."

In conformity to the act of the congress of the United States, intituled, "An act for the encouragement of learning, by securing the copies of maps, charts, and books, to the authors and proprietors of such copies during the times therein mentioned." And also to the act, entitled "An act supplementary to an Act, entitled, "An act for the encouragement of learning, by securing the copies of maps, charts, and books, to the authors and proprietors of such copies during the times therein mentioned," and extending the benefits thereof to the arts of designing, engraving, and etching historical and other prints."

D. CALDWELL,
Clerk of the District of Pennsylvania.

APOLOGY.

In offering an abridged edition of Baudelocque's Midwifery to the public, I have been influenced but by the desire of extending the best system on this subject I believe this or any other country is in possession of. I have used Mr. Heath's translation of this work, as it is the only one extant; and by comparing it pretty extensively with the original, find it at least faithful, if not elegant.

The mode I have almost exclusively pursued, has been, to retain, wherever compatible with the design, either whole paragraphs, or such portions of them, as best suited the object of the abridgment; where this has not been adhered to, I have condensed in as small a compass as I was capable, the meaning of the author. At other times, I have left out entire chapters, from an opinion, they were either useless or unnecessary, to the intended form of the work; thus, I have omitted his considerations on the use of the Lever, as it is merely a critique upon a number of gentlemen's mode of using it; and though it must be acknowledged he has done this in the most masterly manner, yet it does not add a particle to the student's knowledge; I consider myself in this the more excusable, as he has given in another place the cases in which he judged it proper to employ this instrument, and direction for its application. I may urge a similar reason for the omission of the chapter on the section of the pubes. In this our author has so fully demonstrated its inutility, and so completely triumphed over its advocates, that it is now no longer considered as a resource of the art. It would have, therefore, been more

than idle, to have given a description of an operation never to be performed; or even to have detailed the reasons by which he gained this victory. It may be proper, however, in this place, to state, that it has been almost exclusively the honour of Baudelocque, first to call in question the propriety of this cruel operation, and next to demonstrate, in the most satisfactory manner, its inutility, or rather insufficiency for the object proposed.

I have made some other omissions of a minor kind, but none, I trust, to injure the work, or mislead the student; on the contrary, I am of opinion it can well bear this pruning, and all that is useful be retained. Unnecessary repetition, useless detail, and tedious minuteness, are the frequent faults of our author; these I have endeavoured to obviate.

With a view to an extensive circulation of this truly valuable work, cheapness has been regarded; to insure this, the work is condensed into one volume, which will bring it to a moderate price.

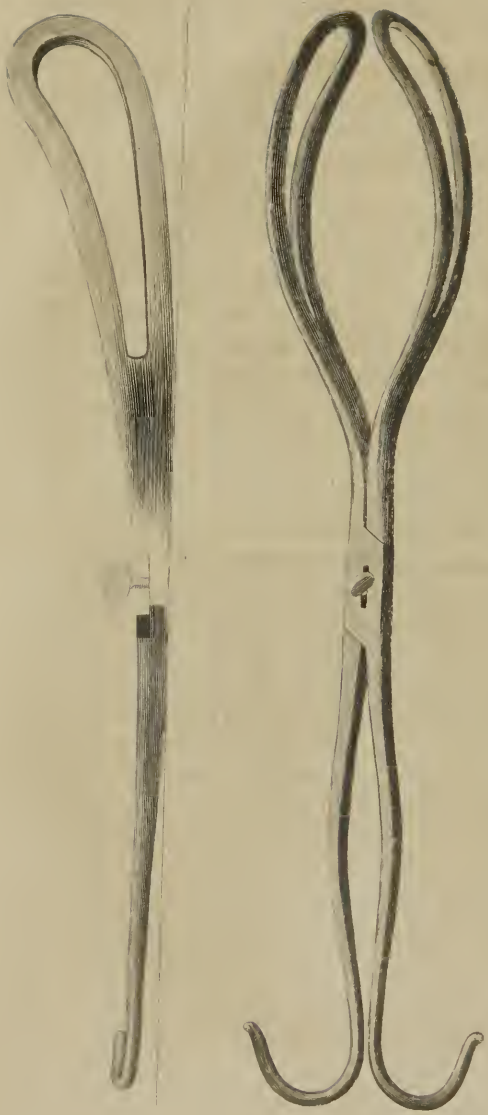
A number of engravings have also been omitted in this edition, as it is conceived they administer nothing to the student's information, while they very considerably augment expense.

I have occasionally added notes, but not in sufficient number, I trust, to materially enhance the price of the work. They could easily, and perhaps advantageously, have been extended, but powerful motives withheld me. For readers kindly disposed, they may be found enough, and for the fastidious perhaps too many.

W. P. DEWEES.

Philadelphia, 20th November, 1807.

Plate VII.



TO INSTRUMENT MAKERS.

THE forceps delineated in plate VII. are reduced to a third of the size of the original. They differ a little from these expressly mentioned in this work: 1st. In not having the thread running round the edges of the internal face of the forceps. 2d. In having the internal edges of the openings in the blades made nearly as thin as the external or superior and inferior edges; by which means more room is allowed for the head to accommodate itself when seized by the instrument. This is considered as a great improvement; for in the common way of making these instruments, the blades are pierced in the middle, where they are of considerable thickness, and this thickness is allowed to remain, and consequently diminishes the space between the blades when fixed. Now by taking down these edges, and making them nearly as thin as the external or superior and inferior edges, much room is gained. 3dly. The slide at the top of the female branch, which was intended to secure the pivot of the male branch, is omitted as useless.

ADVERTISEMENT.

MR. EBERLE,

No. 11, *North Sixth-Street.*

MADE the improvement just spoken of; he worked in Paris under the direction of Baudelocque himself, and is considered particularly fortunate in making his Midwifery Instruments.

Directions for placing the Plates.

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A SYSTEM

OF

MIDWIFERY.

PART I.

Of those Parts of Anatomy, Physiology, and other Sciences, relative to Midwifery.

1. MIDWIFERY is the art of facilitating the exit of the child, and all its appurtenances, from the womb of its mother.

2. This operation, which is entirely mechanical, and subject to the laws of motion, is most frequently performed by the natural force of the organs of the woman; but no other function of the animal economy requires the concurrence of so many powers, or is so laborious and painful. The facility of its execution always depends on the union of many causes; and the failure of any one of them may render it difficult, often dangerous, to both mother and child, and even impossible without assistance.

3. If the office of the accoucheur is in some measure reduced to that of a mere spectator, in those cases where this function is performed according to the intentions of Nature, there are others in which his assistance is absolutely necessary. Sometimes it is proper to moderate the action of the natural powers, which would expel the child too

suddenly; sometimes to augment this action, or supply the want of it; to weaken the resistance of the parts which form the passage, to render it pervious to the child; or to open it another issue, &c. But what a fund of knowledge is necessary to enable us to distinguish between the boundaries of Art and Nature! to know when to let that provident mother act, or to assist her seasonably! We ought to be acquainted, in every possible respect, with the parts of the woman concerned in delivery; the mechanism of that important function, the manner in which it is performed, the requisite conditions for it, the causes which may render it difficult, or obstruct it; and the indications which each of them prescribes. If some parts of this knowledge may be acquired by study and meditation, there are others which can only be the fruit of practice.

Of the Parts of the woman concerned in Delivery.

4. Among the great number of parts concerned in delivery, some serve to expel the child, and others merely form the canal destined for its passage; which permits us to divide them into active and passive. The former comprehends the *uterus*, the abdominal muscles, &c.; the latter the *pelvis*, and the soft parts which cover it, both within and without.

Of the Female Pelvis, considered with respect to Delivery.

5. The *pelvis*, considered without the soft parts which cover it on all sides, is a kind of irregular bony cavity, situated below the spine, of which it forms the basis, and above the inferior extremities with which it is articulated. The facility of delivery always depends on the more or less favourable proportion which the dimensions of the *pelvis* bear to those of the child's head, and from thence arise the greatest obstacles to oppose it.

6. The *pelvis* in an adult is formed but of four bones; *viz.* the *ossa ilia* or *innominata*, which constitute the sides and the fore part; the *sacrum* and *coccyx*, which form the back part: but we observe a greater number in the *fœtus*, and in infancy; each *os ilium* being then composed of three parts—the *ilium* (properly so called) the *ischium*, and the *pubes;* the *sacrum* of five, called false *vertebræ;* and the *coccyx* of three, as it likewise is in the adult.

7. Most of these bony pieces are soft and flexible in the *fœtus*, some of them being still in a manner cartilaginous; and the edges of the others are found incrusted with a similar substance. It is some time before they acquire that solidity which constitutes the essence of bone. This disposition is not peculiar to the bones of the *pelvis*, at the time of birth, when the man, if I may be allowed the expression, is no more than sketched; for Nature follows the same course in the development of all the parts which are to form the frame of the edifice. Those who have thought they discovered dispositions favourable to delivery, in the mustiplicity of bones which form the *pelvis of the fœtus*, in the

manner of their connexion, and in the little solidity which results from the whole, and who have advanced that those bones undergo the same changes of figure in the course of labour as those of the *cranium*, have deceived themselves; and we may be assured that their opinion is as little consonant to reason as to experience.*

Of the Os Ilium.

8. The *os ilium* is the largest of the three pieces which compose the *os innominatum* in the *fœtus;* it is placed at the side of the *pelvis*, and is commonly called the hip bone. Its form is nearly triangular; we observe two faces in it, one of which forms part of the inside of the *pelvis*, the other the outside; three edges, *viz.* the superior, the anterior, and the posterior; as well as three angles.

9. A kind of angle, or line, pretty sharp in the posterior two thirds of its extent, and a little rounded in the rest of its length, cuts the internal face of the *ilium* a little obliquely, from above downwards, and from behind forwards, and divides it into two parts. The superior, which is larger, and a little concave, forms the *iliac fossa:* the other, which is inferior, presents behind a sort of tuberosity, to which is attached a great number of tendinous and ligamentous fibres; and a little forwarder a cartila-

* "In the *fœtus*, says a modern accoucheur, the *pelvis* is "soft and flexible, which facilitates the different attitudes it "takes in the *uterus*, and favours delivery by the breech, and "feet: in both cases, the pieces of which it is composed per- "form by their flexibility what the bones of the head do in "a natural birth." M. D. Leurie, nouv. ed. § 8.

ginous articular impression which has some resemblance to a crescent. The rest of the internal face of the *ilium* makes part of the brim and cavity of the *pelvis* and describes a very small portion of a circle.

10. The external face of the *ilium*, more irregular still than the internal, is so little important to the accoucheur, that I shall dispense with describing it. It is covered by the *glutei* muscles which are attached to it.

11. The superior edge of the *ilium*, which is called the *crista*, is turned nearly like the italic *S*. It is cartilaginous in infancy; of an irregular thickness in the adult; and about seven or eight inches long in a woman of the middle size. It is divided into two lips, and an interstice, to determine more exactly the insertions of certain muscles, which will be mentioned in the sequel. The internal lip forms a kind of angle more or less obtuse, at about the posterior third of its length, where is inserted a ligament, attached at the other end to the transverse *apophysis* of the last *vertebra*. See § 42.

12. The anterior edge of the *ilium* is much shorter than the superior. An *apophysis* which rises in the middle of it, and which anatomists call the anterior inferior spine of the *ilium*, makes two superficial notches, one of which only gives passage to a few nervous cords, but the other serves as a pulley to the tendons of the *psoas* and *iliacus* muscles. The meeting of the anterior with the superior edge forms almost a right angle, which is called the anterior superior spine of the *ilium*, to distinguish it from the other *apophysis* mentioned above. They serve for the insertion of several muscles.

13. We see nearly the same disposition in the

posterior edge of the *ilium;* a bony projection makes two notches in it, of which the largest only forms the summit of one more considerable, placed at the side of the *pelvis*, and a little backward, called the *sacro-ischiatic* notch. The union of this edge with the superior forms another angle, called the posterior superior spine of the *ilium*.

14. The meeting of the anterior edge of the *ilium* with the posterior forms an angle much thicker, and more obtuse, than the preceding; on which account some anatomists have regarded it as the basis of this bone. We observe three cartilaginous impressions in it, which have no resemblance to each other. One, pretty large, a little concave, and whose superior edge describes a kind of crescent, forms nearly a third of the *acetabulum*, which receives the head of the *os femoris;* and it is by the two others that the *ilium* is united, and as it were soldered, to the *ischium* and *pubes*, as will be seen in the sequel. The cartilage which covers the acetabular portion is extremely thin, very smooth, and continually moistened during life by a mucous liquor, known by the name of *synovia*. Those which cover the other two *facettes* are of a different nature: similar to the cartilage which every where unites *epiphyses* to the bodies of bones, they are only found in infancy; and insensibly change into bone, in proportion as the subject advances towards adult age.

Of the Os Ischium.

15. The *os ischium* is situated almost perpendicularly under the *ilium*. As its irregular figure renders the division of it in some sort arbitrary, I shall distinguish three parts in it, of which one forms the body, and the others the extremities.

16. The first is triangular: one of its faces regards the inside of the *pelvis;* the second, the outside; and it is on the third, called the *tuberosity* of the *ischium*, that the body rests when we sit. Of the angles of the body of the *ischium*, two form the edges of the *tuberosity*, internally and externally, and which anatomists call the lips of the *tuberosity;* the other is of a semilunar form, and makes part of the *foramen ovale*.

17. A long *apophysis*, a little flatted, pretty broad at its origin, and narrower at its extremity, terminates the *os ischium* forwards, and is considered as the branch of it. One of the edges of this *apophysis* contributes to the formation of the *foramen ovale;* and the other to that of the arch of the *pubes*, or the great notch at the fore part of the *pelvis*. Its point is joined to a production of the *os pubis*, by means of a cartilage which always ossifies before the age of puberty.

18. The posterior extremity of the *os ischium*, more voluminous than its body, presents a sort of irregular mass, on which however we may distinguish five faces of an unequal breadth; with a much greater number of edges and angles, which I shall not undertake to describe. Of these faces, three are cartilaginous, and destined to the same uses as those on the inferior angle of the *ilium;* that is to say, one of them makes part of the *acetabulum*, and

the two others serve for the union of the *ischium* with the *pubes* and *ilium;* the fourth regards the inside of the *pelvis*, and the fifth the outside. This last seems to send out an *apophysis* backward, and a little obliquely downward, pretty sharp, and of the length of five or six lines,* which is called the ischiatic spine.

Of the Os Pubis.

19. The *os pubis*, commonly called the share bone, with its fellow, form the anterior part of the *pelvis*: the body of this bone is almost triangular in the middle, flatted towards the place of its union with that of the other side, and pretty thick at the other extremity which makes part of the *acetabulum.*

20. The superior face of the *os pubis*, broad behind, narrow before, and a little concave between its extremities, serves for a channel to the crural vessels at their exit from the *abdomen.* The internal and external faces present some little difference; they are broad before, and narrow towards the acetabular extremity. The superior and internal angle of the body of the *os pubis* is sharp and makes part of the brim of the *pelvis.* The external angle is rounded, and the inferior semilunar; this last forms a portion of the *foramen ovale.*

21. The large extremity of the *os pubis*, which I shall call acetabular, presents two little faces somewhat lengthened, by which it is united to the *illium* and *ischium*, by means of a cartilage which

* A line is the twelfth of an inch.

ossifies insensibly, and in time totally disappears. We remark also at this extremity another *facette*, much more extensive, a little concave, and covered with a layer of cartilage extremely thin, by which the *os pubis* concurs with the *ilium* and *ischium* to form the *acetabulum*.

22. The anterior extremity of the *os pubis* presents a cartilaginous and ligamentous impression, fifteen or eighteen lines long, and about six in breadth, which serves for the union of this bone with its fellow. The direction of this articular impression is almost vertical when the *pelvis* rests on the tuberosities of the *ischia* and the point of the *coccyx;* but its inferior extremity is more or less inclined backward when the subject is standing. The middle of its internal edge only is covered with a very smooth cartilage, as are all the extremities of bones joined by a moveable articulation.

23. This *ligamento-cartilaginous* impression, and the superior face of the body of the *os pubis*, form at their union almost a right angle, which is called the angle of the *pubes*. Above, and a little on one side of this angle, appears a kind of tuberosity, sometimes even a sort of spine, more or less salient, which serves for the insertion of the *rectus* muscle, as well as the pyramidal, and the external and inferior portion of the abdominal ring.

24. A production about seven or eight lines in length, pretty broad and flat superiorly, but narrower at its point, descends from the anterior extremity of the body of the *os pubis*, and passes commonly for the branch of that bone. It is, as it were, twisted from the inside of the *pelvis* outwards, in

such a manner that one of its edges is almost anterior, and the other posterior: the posterior makes part of the *foramen ovale;* the anterior, part of the arch of the *pubes.*

25. The branch of the *pubes* does not descend perpendicularly to the horizon; it constantly inclines towards the *foramen ovale*, and much more in women than in men: which renders the arch of the *pubes* much wider in them at its upper part, and favours delivery as much as a contrary disposition would obstruct it.

Of the Union of the Ilium, Ischium and Pubes; of the common Parts which result from that Union; and of the natural Dimensions of the Os Innominatum in Adults.

26. These three bony pieces, destined to form but one after infancy, are united in that early age by a pretty thick cartilage, but of a different nature from those which form part of the *sacro-iliac symphyses*, and that of the *pubes;* for it is in its nature to ossify, which it always does: whereas the latter never do but by accident, and that is exceedingly rare. This junction of the *ilium*, *ischium* and *pubes*, is made near the middle of the *acetabulum*, and always with so much regularity, that after some time it can scarcely be distinguished; unless it be above the cavity, where we see a line more or less salient, which anatomists call *linea ilio-pectinea*, because it is formed by the union of the *ilium* and *pubes.*

27. It often happens, in children affected by the rickets before the age in which this consolidation

is perfect, that the three pieces which form the *acetabulum* are pushed inwards by the head of the *femur*, which narrows the entrance of the *pelvis*, and renders it so irregular as often afterwards to cause the greatest obstacles to delivery.

28. The junction of the branch of the *pubes* with that of the *os ischium*, is likewise made by a cartilage which ossifies after some years. By the connexion of these two bones, is formed that great oval aperture which we see on each side of the forepart of the *pelvis*, as well as the notch in the anterior edge of the *acetabulum*.

29. The *os innominatum*, in a woman of the ordinary size, is about six inches broad, from the anterior superior spine to the posterior superior. Its height is nearly six inches and a half, taken from the anterior spine to the bottom of the tuberosity of the *ischium;* and an inch more, if taken from the middle of the *crista* of the *ilium*. The knowledge of this height may serve to determine the depth of the cavity of the *pelvis* laterally, from the superior to the inferior *strait*.

Of the Os Sacrum.

30. The *sacrum* represents a kind of inverted pyramid, flatted, and a little bent inwards. We are to consider in it, the base, the point, the faces, and edges.

31. The base of the *sacrum* being broader before than behind, pretty much resembles the section of a cone. In the middle of it, we see a cartilaginous impression of an oblong figure, and cut very obliquely from before backwards, by which

the *sacrum* is articulated with the body of the last lumbar *vertebra*. Two little masses, which are also articular, seem to be fixed on the posterior edge of this impression, near its extremities, and with them form channels which lodge the fifth pair of *lumbar* nerves, at their exit from the vertebral canal: these *apophyses* unite themselves to similar ones of the aforesaid *vertebra*, as we shall see hereafter.

32. The point of the *sacrum* presents also a cartilaginous *facette*, transversely oblong; but much smaller than that of the base, and inclined in a contrary direction; and with that the *coccyx* is united.

33. The anterior face of the *sacrum* describes a curve of the depth of about half an inch. We observe in it four transverse lines, resulting from the consolidation of the five pieces which constituted this bone in early infancy. These lines terminate at each side in as many holes, which pierce the thickness of the bone very obliquely, and whose use is to give passage to the *sacral* nerves. These holes communicate with a canal, whose apertures may be seen on the posterior face of the *sacrum:* they are not all of the same size; and some of them are lengthened in form of a groove, towards the edges of the bone: they are called the *sacral* holes.

34. The posterior face is convex, and rough with a great number of *tubercles*, of which some answer to the spinous *apophyses* of the *vertebræ*, and others to the oblique and transverse eminences. We see in it also eight holes, placed in two rows, whose use is to give passage to some nervous fibres and blood vessels. Above and below the spinous *tubercles* are two other apertures, nearly of a triangular figure, of which one forms the beginning, and the other the end of the *sacral canal.* From the extremity of this canal descend two little productions,

in the shape of a bodkin, which unite by means of a ligament with the superior and posterior part of the *coccyx*.

35. Each edge of the *sacrum* presents superiorly a large cartilaginous impression, perfectly similar to that of the *os ilium*, with which it is joined. These articular impressions, nearly of a semilunar figure, are cut obliquely from above downwards, from without inwards, and from before backwards; so that their anterior edge and their superior extremity are farther from a line which would divide the *sacrum* vertically into two equal parts, than their posterior edge and their inferior extremity: whence we see that the *sacrum* is fixed between the *ossa ilia*, after the manner of a double wedge, with the base above and before. There is nothing very remarkable in the rest of the edges of the *sacrum*, unless it be a little notch in their inferior extremity. The length of this bone is usually from four inches to four and a half; its greatest breadth four inches; and its thickness, taken from the middle of its base anteriorly, to the extremity of the spiny *tubercle* of its first false *vertebra*, is two inches and a half. This last dimension varies so little, that I have not found a difference of a line in been thirty and forty *pelves*, the greater part of which were deformed; which is as we shall see hereafter, very important to be known.

Of the Coccyx.

36. The *coccyx* is usually formed of three pieces, which altogether produce nearly the figure of a pyramid, twelve or fourteen lines long and

sometimes more, a little bent forward, and bound by its base to the point of the *sacrum*. I shall say no more of these three pieces than what is necessary to show their connexions with each other, and with the *sacrum*. The breadth and thickness of the *coccyx* diminish insensibly from the top of the first piece to the extremity of the last; we may consider in each of them a base, a point, two faces, and two edges. The base of the first presents an oblong *facette*, covered with a *ligamento-cartilaginous* substance, by which it is united to the extremity of the *sacrum;* and, at the sides and back part of this substance, two longish *tubercles*, in which are inserted as many ligaments. The point is rounded, and covered by an articular cartilage, like a little flatted head: it is received into a superficial cavity which is observed in the base of the second piece, and forms with it a kind of articulation, whose emotions, though limited, are preserved a longer time than those of the whole of the *coccyx* on the *sacrum*. We find nearly the same relation, the same reciprocity of figure, between the point of the second piece and the base of the third; consequently the same kind of connexion. This third piece is longer and narrower than the preceding, and terminates in a sort of *tuberosity*, like the last *phalanges* of the fingers.

Of the Union of the Bones of the Pelvis.

37. The *ossa pubis* are joined together by means of a substance which has always been described by the name of *cartilage*, though it differs as much from that as from a ligament. According to some

anatomists, each *os pubis* is covered by its own cartilage: their junction is not a true *synchondrosis*, but a close articulation, which only admits of insensible motions.

38. By carefully examining this *symphysis*, we observe that each *os pubis* is really covered by a cartilage at its anterior extremity; that this cartilage is thicker before than behind, and in its superior and inferior parts than in the middle of its length; that these bones, thus covered, are bound together by means of a substance which seems ligamentous, and whose fibres which are mostly transverse, go from one to the other; that these fibres are so disposed, that the deepest are the shortest, and the most superficial the longest; that they leave between one another a kind of meshes filled with reddish *corpuscles*, very like those which are seen about the moveable articulations, and which are commonly supposed to be *synovial glands*. We observe, farther, that this fibrous and ligamentous substance does not occupy the whole thickness of the *symphysis*, and does not bind the bones together through the whole extent of the surfaces presented by their anterior extremities; but that there exists a true articulation, of the species known by the name of *arthrodia*. If we open this *symphysis* towards the inside of the *pelvis*, after a cellular tissue, very thin and loose, which we meet with first, we discover a capsular membrane, whose most apparent fibres are transversal; afterwards two cartilaginous *facettes*, smooth, polished, and moist, from six to eight lines long, and two broad, of a figure a little semilunar, lightly convex on one bone, and concave on the other. These *facettes* comprehend nearly the middle third of the length of the *symphysis*, and the posterior third of its thickness.

This *symphysis* then presents in one third of its extent, or thereabouts, a true articulation; and, in the rest, a *syneurosis* and *synchondrosis* at the same time.

39. This compound and articular substance, being detached from the bones, forms a kind of wedge, whose base constitutes the anterior part of the *symphysis*, and its edge the posterior; so that these bones seem to touch towards the inside of the *pelvis*, and appear separated to the distance of several lines without. The base of this kind of wedge is generally from four to six lines broad, towards the middle of the length of the *symphysis*, and from eight to ten in the inferior and superior parts; while the edge, at most, does not exceed one line. Its thickness, taken according to that of the bones, is greater above than below; where this substance, become thinner, forms what is called the triangular ligament.

40. This first means of union was not sufficient to give these bones the firmness necessary for the free exercise of the functions to which the *pelvis* is destined; it is covered and fortified in all parts, but especially before, by bundles of ligamentous and aponeurotic fibres. Independently of the thick and very strong ligamentous structure which forms the forepart of the *symphysis*, we observe bundles of tendinous fibres, which decussate each other a thousand ways, some of which arise from the interior *graciles* and the external *obturators*, and others from the external portions of the inguinal rings. I shall remark, too, that the triangular expansion which terminates the *symphysis* inferiorly, and which forms the top of the arch of the *pubes*, seems to have other uses than that of binding the bones together.

41. The *os sacrum* is engaged like a wedge between the posterior parts of the *ossa innominata*, to

which it is united. Although some anatomists pretend that this union is like that of the *ossa pubis*, yet we may observe a great difference between them; for here each articular *facette* is covered by a true cartilaginous layer, and we see on each side inequalities which are mutually received; but we see nothing of that kind in the junction of the *pubes*. These articular cartilages have not the same thickness on each bone; that which belongs to the *sacrum* being nearly throughout one line thick, and that of the *os ilium* being extremely thin. They are whitish, streaked as it were in many places and moistened with a small quantity of *synovia*. We cannot discover, in any part of these articular surfaces, any transverse fibres which go from one bone to the other, as is observed in the connexion of the *ossa pubis:* so that these articulations, which I shall often mention by the name of *sacro-iliac symphyses*, derive all their strength from the great number of ligaments which surrounds them.

42. Most of these ligaments are very short, and do not extend beyond the edges of the articular *facettes:* there are others longer, to be seen above, below, and behind these *symphyses*.

43. The former may be called the anterior *sacro-iliac* ligaments: they are disposed like bands which pass transversely from the anterior edge of the articular *facette* of the *os ilium* to the edge of that of the *sacrum*, and the greater part are very thin. The strongest and thickest of these ligamentous bands are before the summit of the *sacro sciatic* notch, and at the bottom of the *sacro-iliac symphysis;* we must likewise add a capsular membrane.

44. The most remarkable superior ligaments are two on each side. One descends from the inferior edges of the transverse *apophyses* of the last *lumbar*

vertebra to the superior edges of the articular *facettes* of the *sacrum* and *ilium*, spreading itself over the top of the *symphysis;* and the other goes from the points of those same *apophyses* to the angle made inwards by the *crista* of the *ilium*, from whence they advance a little forward, and form a kind of small *falx* above the *iliac fossa*.

45. The inferior ligaments, one on each side, known by the name of *sacro-ischiatic*, arise from some of the inequalities of the posterior part of the *sacrum*, the *coccyx*, and even of the *ilia:* they are broad and thin backwards, but they narrow and thicken as they advance forward. Towards the middle of the *ischiatic* notch, these ligaments divide themselves into two branches, the shorter of which terminates in the spine of the *ischium*, and the longer in the internal lip of its tuberosity: this latter advances towards the *pubes*, and in its course forms a kind of *falx*, which has caused it to be called the falciform ligament. These two ligamentous branches leave between them a kind of triangular space, through which pass some nerves, and the *tendon* of the internal *obturator*.

46. The posterior ligaments, more numerous and shorter, but much stronger and tighter, than these last, go from the *os ilium* to the *tubercles* of the *sacrum*, which by their situation resemble the oblique *apophyses* of the second, third, and fourth false *vertebræ*, of which this bone was originally formed.

47. The *sacrum* is not only articulated with the *ilia*, but also with the *spine* and *coccyx*. It is joined to the *spine* in three different places: 1. It is united by that cartilaginous impression transversely oblong, which we see in the middle of its basis, to a similar impression in the body of the last lumbar

vertebra, by means of an elastic substance; 2, and 3, by two little articular masses which are fixed in the posterior edge of that first impression, and which answer to similar substances in the *vertebra* before mentioned.

48. The elastic substance which unites the middle of the base of the *sacrum* to the *spine*, is entirely similar in its nature to that seen between the bodies of all the *vertebræ*. It is very thick before, and thin behind; which renders the angle necessarily resulting from the disposition of the articular *facettes* of these two parts more obtuse. This *sacro-vertebral* junction is surrounded by an infinity of ligaments, some without, and others concealed within the spinal canal.

49. All motion is not prohibited in this kind of junction; but, as it only depends on the compression of the intermediate substance, it can be but very small. If the *pelvis* executes a larger motion on the *trunk*, we must regard it as one composed of those which take place between each of the *lumbar vertebræ*, and between the lower ones of the back.*

50. The motion which is permitted between the body of the last *lumbar vertebra* and the base of the *sacrum*, is never extensive enough to make any alteration in the degree of acuteness of the angle which results from their junction; but the convexity of the *lumbar column* may be augmented or diminished, by means of the compound motion just mentioned, ac-

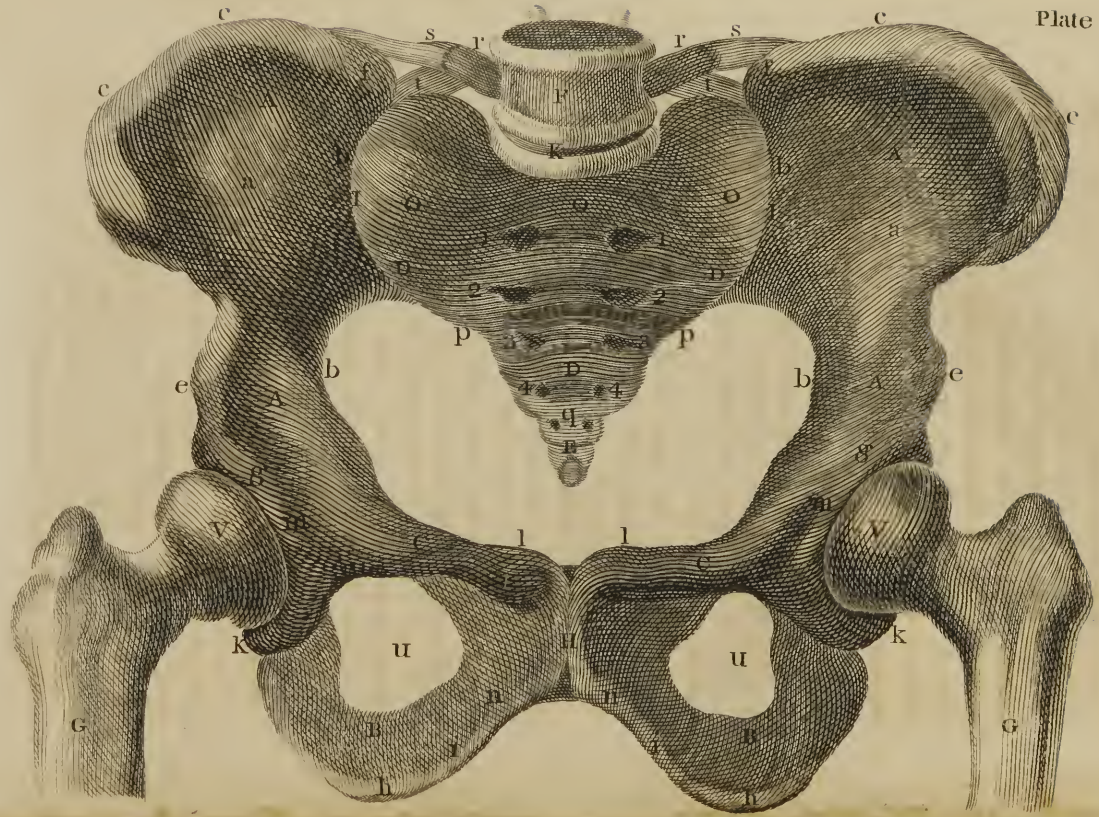
* It would be an error to believe, as some have done, that the projection formed by the union of the *sacrum* with the last *lumbar vertebra*, may be augmented or diminished by that motion; and that error might contribute to deprive women of a means which generally relieves those troublesome pains in the back which so frequently torment them during labour.

cording as the trunk is bent backward or forward, or by raising or lowering the breech when the woman lies on her back; which merits particular attention in the practice of midwifery. We may by this means make a favourable change in the direction of the axis of the *pelvis*, relatively to that of the *trunk*, to that of the *uterus;* and in the direction of the expulsive forces of the latter, which may be rendered more or less efficacious, according to circumstances, by making the woman preserve a proper attitude.

51. The junction of the *coccyx* with the *sacrum* is entirely similar to that called *sacro-vertebral*, with respect to the medium which constitutes it: it permits that appendix to move, and yield to the pressure it undergoes in different circumstances. This mobility, which is extreme in youth, diminishes insensibly, and in time is entirely lost. If it diminishes considerably, or is lost before the time in which a woman becomes sterile, it produces in some cases, but very rarely, an obstacle to delivery.

52. The *pelvis* has connexions with the inferior extremities, which are not so important for the accoucheur to know as some have endeavoured to persuade us. Any fault in them cannot disturb the natural course of labour, when the *pelvis* is well formed; and in general they are a consequence of the deformity of that. These articulations are *enarthroses*, which permit motion in every direction.

Plate I.



Explanation of the First Plate.

This figure presents a well formed *pelvis*, whose parts are all reduced to about half their natural size.

A, A, A, A, The *ossa ilia*, properly so called.

a, a, The *iliac fossæ*.

b, b, b, b, The angle which divides transversely, and obliquely from behind forward, the internal face of the *os ilium* into two parts, and which makes part of the brim of the *pelvis*.

c, c, c, c, The *cristæ* of the *ossa ilia*.

e, e, The anterior superior spines of the *ossa ilia*.

f, f, The angle formed by the internal lip of the *crista* of the *ilium* towards the extremity of its anterior two thirds, and to which is attached a ligament inserted at the other end in the transverse *apophysis* of the last *lumbar vertebra*.

g, g, The inferior angle of the *os ilium* which makes part of the *acetabulum*.

B, B, The *os ischium*.

h, h, The tuberosities of the *os ischium*.

i, i, The branches of the *os ischium*.

k, k, The posterior part of the *os ischium*, which makes part of the *acetabulum*.

C, C, The body of the *os pubis*.

l, l, The angle of the *os pubis*.

m, m, The posterior extremity of the *os pubis*, which makes part of the *acetabulum*.

n, n, The descending branch of the *os pubis*, which unites with that of the *ischium*.

D, D, D, The *os sacrum*.

1, 2, 3, 4, The anterior *sacral holes*.

o, o, o, The base of the *sacrum*.

p, p, The sides of the *sacrum*.

q, The point of the *sacrum*.

E, The *coccyx*.

F, The last lumbar *vertebra*.

r, r, The transverse *apophyses* of that *vertebra*.

s, s, The ligament which goes from the transverse *apophysis* of the last *vertebra* to the angle of the internal lip of the *crista* of the *os ilium*, indicated by the letters f, f.

t, t, Another ligament which descends from those same *apophyses* to the superior edge of the *sacro-iliac symphyses*.

G, G, The *femur*, or thigh bone.

V, V, The head of the *femur* received in the *acetabulum*.

u, u, The *foramina ovalia*.

Symphyses of the Bones of the Pelvis.

H, The *symphyses* of the *ossa pubis*.

I, I, The *sacro-iliac symphyses*.

K, The *sacro-vertebral symphysis*.

Of the Separation of the Bones of the Pelvis in Labour.

53. However firmly the *ossa innominata* and the *sacrum* are united together—however numerous the means which nature has employed to give this assemblage the stability necessary for the free exercise of the motions of the trunk and inferior extremities, of which it is in some sort the centre—their *symphyses* may nevertheless be relaxed and weakened to such a degree, as to allow an apparent mobility; they may yield to the impulse of external agents; even by the efforts of labour they may extend, or tear, and permit the bones to separate;

which in either case might seem necessarily to procure a greater capacity in the *pelvis*, and give an easier passage to the child. Such in fact is the opinion of the greater part of those who have written on the art of midwifery for these two thousand years. The divine wisdom, which presides over all things, appeared to them equally wonderful in this separation, and in the solidity which it was likewise necessary to give to the *symphyses* of the *pelvis;* and without this double advantage, according to those authors, the woman could not have transported herself from place to place so conveniently and safely, nor bring forth children so easily.

54. All authors have not however had the same idea of the separation of the bones of the *pelvis*. If some, zealous admirers of the resources of nature, entirely occupied in the preservation of the mother and child, have found nothing in it but an effect worthy of her providence; others have regarded it as a morbific state, and many have even contested its possibility.

55. Such has been in all ages the variety of opinions on this point. It is very certain that the bones of the *pelvis* may separate in labour, but that does not happen so often as has been thought; and experience demonstrates that this separation, far from being common, is very rarely met with, and is not more usual after a laborious, than after an easy labour; nor in a distorted *pelvis*, than in one well formed. I have sought for it twenty times in all these cases, by opening the bodies, and have scarcely met with one which could remove all doubt of its existence.

56. The infiltration of *serum* into the ligamentous tissue of the *symphyses*, must be regarded as the most usual predisposing cause of the separation

of the bones of the *pelvis*, and whatever may occasion that infiltration will become the remote cause. The pressure which the *uterus*, loaded with the produce of the conception, exerts during several months on the trunks of the vessels which are distributed to these *symphyses*, and on those which return the blood from the inferior extremities cannot alone produce this effect; and, for it to take place, we must likewise admit a peculiar alteration in the fluids, to render them fitter for it. This pressure is nearly the same in all women who have the *pelvis* well formed; and yet the relaxation of the *symphyses* does not exist in all of them at the time of labour. It is also more considerable in women pregnant of several children, as well as in those who have a narrow *pelvis;* and nevertheless the relaxation is not more frequent in those cases than in others. In examining the bodies of several woman who had the *pelvis* singularly deformed, I found the *symphyses* as firm and tight as in the natural state, although they died in childbed; and there was in several of them a considerable collection of fluid through the whole extent of the inferior extremities, and of the *pudendum*. Whatever may be the remote cause of the relaxation of the *symphyses*, that accident is not less the most usual predisposing cause of the separation of the bones of the *pelvis;* and it was acknowledged to be such in the time of *Severin Pineau*.—See his Opusc. d'Anat. et de Physiolog.

57. Though the relaxation of the *symphyses*, produced by the infiltration of *serum* into their ligamentous tissue, is generally regarded as the predisposing cause of the separation of the bones of the *pelvis*, the swelling of the cartilages which make a part of those *symphyses* cannot be looked upon as the immediate cause of it. Whatever relaxation

may affect the ligaments, the cartilages which incrust the extremities of the *ossa pubis*, as well as the articular *facettes* of the *ossa ilia* and the *sacrum*, are no thicker: therefore they cannot act as so many wedges placed between those bones, as the roots of ivy do which grow and extend themselves in the clefts of rocks: or like wedges of dry wood drove into holes bored in them, in order to separate large masses from them.* The structure of the *symphyses*, better known at present, no longer admits those ingenious *comparisons;* and the explication of the phenomena is not less clear no that account. The wedge which separates the bones of the *pelvis* does not act between the extremities of those bones, but in the circle formed by their assemblage in the *pelvis* itself; it is the *uterus* charged with the produce of conception in the latter periods of pregnancy, and the child's head forced down by the action of the *uterus* and of the abdominal muscles in time of labour. However considerable this separation may be on some occasions, we may presently place the bones again in their natural contact, and render the *symphyses* as close, though not so solid, as they were originally; which could not be done if the cartilages were tumefied, as some have published. The error of many authors concerning the greater capacity in the *pelvis*, and a greater breath of hips, even in women who have had but one child, is a consequence of the former; and could only arise from the idea which was entertained, that the cartilages which make part of the *symphyses* swell during pregnancy.

58. The separation of the bones of the *pelvis*,

* See Memoires de l'Academie Royale de Chirurgie, tom. iv. Dissertation sur l'Ecartement des Os du Bassin, par M Louis.

which sometimes happens in labour, is not always the effect of a relaxation and stretching of the ligamentous tissue of the *symphyses*. Little disposed to yield thus, in some cases in which the obstacles which obstruct the passage of the child are very great, and the efforts which tend to expel it very strong and lasting, the *symphyses* tear, and permit the bones to separate much farther than they could have done by a simple relaxation. If the passage on that account becomes freer, the consequences of it are also much more disagreeable: being the same as those which have often been observed after the section of the *symphysis* of the *pubes*, I shall take notice of them when I come to treat of that new operation, and shall relate some examples of the rupture in question. That the word *rupture*, which I use here, may not be a cause of error, I must add, that it is not the *symphysis* of the *pubes*, properly speaking, which tears, for no effort can break the ligamentous substance which unites those bones to each other; the *symphysis* detaches itself from one of them, and leaves the bone naked.

59. The natural efforts of labour are not the only ones, which may conduce to this disunion of the *ossa pubis:* it has taken place in instrumental deliveries, to which those efforts seemed to contribute nothing; and it has sometimes been found in consequence of an external percussion, or of a fall.

60. Being deceived in the principle of this separation, they necessarily erred in the consequences deduced from it. It has been so firmly believed to take place in all labours, that it was thought to be absolutely necessary, and that without it many women could not be delivered but with extreme difficulty. " It would be in vain," says *Severin Pineau*, " that the neck of the *uterus* and the other soft

" parts should dilate to give a passage to the child, " if the bones could not separate:"—" otherwise " (adds *Paré*) the child could not pass through so " narrow a way."

61. Having thus mistaken the necessity and pretended advantages of this separation, the natural resistance of the *symphyses*, and, above all, the dryness and rigidity necessarily induced in them by age, were consequently reckoned among the causes of laborious and dffiicult labours. Obstacles have been attributed to the state of these *symphyses*, which merely depended on the resistance of the neck of the *uterus*, and of the external parts; and it has been recommended to moisten and relax them by the use of baths, cataplasms, liniments, fomentations, &c. But what can be expected from such methods, when delivery is obstructed by a narrow *pelvis?*

62. Will any one venture to assert that he has once by such means obtained the effect he expected, and that he has thus assisted labours which could not otherwise have been terminated but by the Cesarean operation, as has been so often published? I should have dispensed with demonstrating the fallacy which has prevailed on this point, if it had not led some practitioners into a very serious consequence;* but the interests of humanity, and the honour of the art, oblige me to expose it, and if possible endeavour to dissipate it. In order to appreciate all these means, and fix the degree of confidence to be placed in them, supposing that they could effect the relaxation of the *symphyses* of the *pelvis*, it is necessary to determine what degree

* See the Chapter on the Section of the *pubis.*

of amplitude can be given to that cavity, by the separation of the bones which constitute it.

63. The *ossa pubis* cannot separate without augmenting the circumference of the *pelvis*. That is a fact so certain, that the smallest doubt of it would be a proof of ignorance. But how much will its diameter be increased? If the circumference were perfectly circular, every possible diameter would partake a third of that augmentation; but as the entrance of the *pelvis* is in general the more elliptic as it deviates more from the natural state, it follows that its different diameters cannot increase in the same proportion, and that there is, as I may say, none but the transversal which can become larger.

64. The augmentation of the *antero-posterior* diameter is reduced almost to *zero*, when the separation is moderate; and repeated experiments have demonstrated that the *ossa pubis* must separate at least an inch to procure two lines in that direction; while the transverse diameter shall be increased six lines, and often more.

65. The *pelvis* being larger in most women than is necessary for delivery, the separation of the bones could be of no advantage to them, nor render their delivery more easy. Far from regarding it, with some ancient authors, as a benefaction of nature, we ought to consider it as an additional source of inconveniences in those women who are subject to it; for on one side we see that a *pelvis* too large exposes the woman to a number of accidents,* and, on the other, that there are some which inevitably accompany the separation, and the mobility of the bones which form that cavity. Far from favouring delivery in all these cases, it could not but ren-

* See Nos. 86, 87.

der it more tedious and painful to the woman, as experience has convinced me.† If we ought to expect any real advantage from it, considering it only with respect to the passage of the child, it could only be in those women who have the *pelvis* deformed; and where the defect which rendered delivery impossible did not exceed two lines at the most, since the separation of an inch cannot procure an augmentation of more than two lines in the small diameter of the superior *strait* (see par. 64,) which is almost always that which occasions the greatest obstacles to the exit of the child. If from a separation of an inch, which has never taken place between the *ossa pubis* without a rupture of their *symphyses*, we are not to expect an augmentation of more than two lines, in the direction of the little diameter of the superior *strait*, what can we obtain from a separation always much less, and so little apparent in most women that we may doubt its existence? The examination of a great number of women who have died in childbed has proved to me that it is excessively rare for the separation in

† A woman of a good habit, and of the middle age, who had been delivered of her first child so quickly that I could scarcely reach her in time, though not far off, in the latter months of her pregnancy, felt acute pains in the *symphyses* of the *pelvis*, which made her walk with uncertainty and difficulty, and even lamely. These pains, supportable then, became so troublesome and violent during labour, and especially while she endeavoured to bear down and assist her delivery, that nothing could engage her to repeat it, nor to alter the attitude which she had mechanically taken, to relax all the muscles that are attached to the *pelvis:* which rendered the labour longer and more painful than the preceding, although the child was much smaller than the former.

question to amount to two lines; and I never found it exceed that but once.*

66. But supposing, which is impossible, that art could procure a separation of an inch between the *ossa pubis* without dividing their *symphyses*, what practitioner would dare to affirm, without fear of being deceived, that the volume of the child's head did not exceed the little diameter of the superior *strait* by more than two lines? If it is difficult to estimate justly the degree of opening in the *pelvis*, it is much more difficult to judge still of the size of the child's head; and it is only by taking the mean between the largest and smallest, that we usually establish the relation of its dimensions to those of the *pelvis;* but a *thereabouts* in the case supposed, cannot supply the place of that precision which would be necessary.

67. We see clearly by these reflections what we ought to think of the means proposed by *Severin Pineau*, with a view of favouring the amplification of the *pelvis;* as well as of those accoucheurs who boast of having delivered women by those means, who must otherwise have undergone the Cesarean operation.

68. The proscription of the section of the *symphysis* of the *pubes*, though performed several times within these ten years with all the success its author could desire, seems an inevitable consequence of those same reflections; that operation being the fruit of an opinion too hastily embraced by persons of science, but too credulous concerning the pretended advantages of the spontaneous separation of the *ossa pubis*.—See the sequel of this work.

* The relaxation of the *symphyses* of the *pubes* was so great, that we could separate them fourteen lines, and put them again in contact. The *pelvis* was of the largest size, and the body entirely putrid.

69. If I have clearly demonstrated the inutility of the most usual separation of the bones of the *pelvis* in labour, how often has experience shown the danger of it! Even if it were in the power of art to procure this separation without cutting the *symphysis* of the *pubes*, if that separation could in some cases destroy the obstacle which obstructed the exit of the child—have the consequences of a spontaneous separation always been so fortunate as to authorize us to give it the preference to other means equally fit to procure that effect, and almost always exempt from inconveniences either to the mother or the child?

70. When this separation has been made suddenly, severe pains in the parts divided, an impossibility of walking, and sometimes even of moving the inferior extremities, inflammation, fever, abscesses, caries, and lastly death itself, have generally been the mournful effects of it. When it only proceeds from a relaxation of the *symphyses*, the consequences are much less severe, it is true; since a painful and tottering walk is the only symptom attending it.

71. If the relaxed *symphyses* at length grow firm again, if the bones of the *pelvis* recover their former stability, if the lameness goes entirely off in some women—how often, on the contrary, have we not observed an inability to walk, or even to move the legs without violent pain, continue for years afterwards!

72. We should be in the wrong if we were to suppose that such a state of weakness and pain always denotes great disorders in the junction of the bones of the *pelvis*. I am convinced that those accidents may be the consequence of a very small separation, and of the slightest movement between the *ossa in-*

nominata. A woman to whom I was called had kept her bed ten months, a prey to the most excruciating pains in the junction of the *ossa pubis*, and of one of the *ilia* with the *sacrum*, whenever she attempted to move the inferior extremities, though we could not discover the least separation of the *symphyses;* we could only find a small degree of mobility in that of the *pubes.* The accident had been first felt in the time of labour, and the midwife was accused of having luxated the bones. The lameness which results from the relaxation of the *symphyses* of the *pelvis* is not always so painful; if the woman suffers pain at first whenever she attempts to walk, it lessens gradually, because the parts which constitute the *symphyses* accustom themselves to the dragging occasioned by the mobility of the bones.

73. According to these observations, the separation of the bones of the *pelvis* will appear to be an unnecessary accident, and sometimes a very serious one; since it may influence the subsequent symptoms, and even affect the life of the woman, or render her existence a long time burthensome. Topical astringents, aromatic fumigations, the cold bath, even almost freezing, are the most proper means, in case of relaxation, to restore the lost tone to the *symphyses;* but they cannot be used in the first periods, for fear of suppressing the evacuation of the *lochia.* In the mean time we must prescribe rest; and fix the bones of the *pelvis* by a proper bandage, if the case require it. * The indications

* A few turns of a bandage rolled tight on the *pelvis* were sufficient, in a woman who had been delivered eighteen or twenty days, to enable her to walk into her chamber, though before she could not move in her bed without great pain: No other means were used but that bandage. Another woman,

are very different, and much more urgent, when the *symphyses* are ruptured: we must prevent inflammation and its consequences, open the abscesses when fit, and treat the caries (which is sometimes the consequence) properly, &c. We are fortunate when the woman escapes even so.

Of the Division of the Pelvis, and of its natural Dimensions.

74. A RIDGE, rarely circular, often elliptic, and sometimes of another figure, but always more or less inclined forward, divides the cavity of the *pelvis* into two parts; of which one forms the upper and the other the lower part.

75. The upper part of the *pelvis*, which the French call the great bason, is very wide at the sides, and quite open before. Its breadth, taken from the anterior superior spine of one *ilium* to that of the other, is usually eight or nine inches, and its depth from three to four. We see in the back part of it the projection of the *lumbar vertebræ*, and at the sides the *iliac fossæ*. The knowledge of this part is not the least interesting with respect to delivery.

76. The lower part called by the French the little bason, forms a kind of canal, whose entrance and outlet are somewhat narrower than the middle;

who had been delivered nine months, having used topical astringents and aromatic fumigations without success, could not recover the faculty of walking but by the use of cold baths almost freezing. †

† I can bear testimony myself in favour of the use of the bandage, a patient of mine being unable to move without it. She was eventually cured by a continuance of it. W. P. D.

which has caused it to be distinguished into the superior *strait*, the inferior *strait*, and an excavation.

77. The superior *strait* is that ridge mentioned in par. 74; it is a kind of circle which forms the entrance of the canal. (See the second plate). Its form is not constantly the same, as I have already remarked; its inclination or obliquity from behind forward, which an accoucheur of the first rank has fixed at from thirty-five to forty degrees (see M. Levret,) cannot be exactly known, because it varies a little in every subject.

78. To determine the extent of the superior *strait* more exactly, it is necessary to take notice of its several diameters. The smallest whose length is in general about four inches, extends from the middle of the projection of the *sacrum* to the superior and internal part of the *symphysis* of the *pubes*. The longest extends from one side of the *strait* to the other, and is usually an inch longer than the preceding. The others are the two oblique diameters: they are of a middle length between the two former; they extend diagonally from each *acetabulum* to the *sacro-iliac* junction of the opposite side. The two former cut the *pelvis* at right angles and the two latter divide those angles into acute ones.

79. The respective length of these diameters, considered relatively to delivery, is not what I have just indicated; the soft parts within the *pelvis* causing some changes in them, if they all equally lose of their length on account of the thickness of the neck of the *uterus*, which is not much when it is entirely developed, being then not thicker than three or four folds of paper, it is not the same with respect to the muscles. The long or transverse diameter is almost the only one which the *psoæ* diminish in their passage: they diminish it more or less

in different subjects, according to their bigness, and according as the *pelvis* is more or less of an elliptical figure; but always so much as to make this diameter appear, at the first cast of the eye, shorter than the oblique. If these muscles take a little from the posterior extremities of the oblique diameter, yet that does not hinder them from being the longest; and we ought to consider them as such in respect to delivery, except in some deformed *pelves*.

80. The inferior *strait*, in general smaller, and of a more irregular figure, than the superior, is not, like that, entirely formed of bony parts; its edge, which three large and deep notches render unequal, being completed behind and at the sides by the *sacro-ischiatic* ligaments, and forming before a kind of circular notch, called the arch of the *pubes*. (See the third plate.) We are also to remark as many diameters in it as in the superior *strait*, and their length is commonly about four inches. Although the transverse, or that which extends from one *ischium* to the other, be often a little longer than that which goes from before backward, it must however be reckoned the smallest with respect to delivery, because the latter augments in proportion as the point of the *coccyx* recedes from the *pubes*. It is very useful to bear in mind, that the great diameter of the inferior *strait* is parallel to the smallest of the superior, and that it crosses the longest of that *strait* at an angle more or less acute. This observation, important for the explication of some of the phenomena of common labour, becomes infinitely more so in the management of difficult labours; and by taking advantage of it, in many cases, the finger alone, well directed, will dispel obstacles which would have been difficult to overcome with instru-

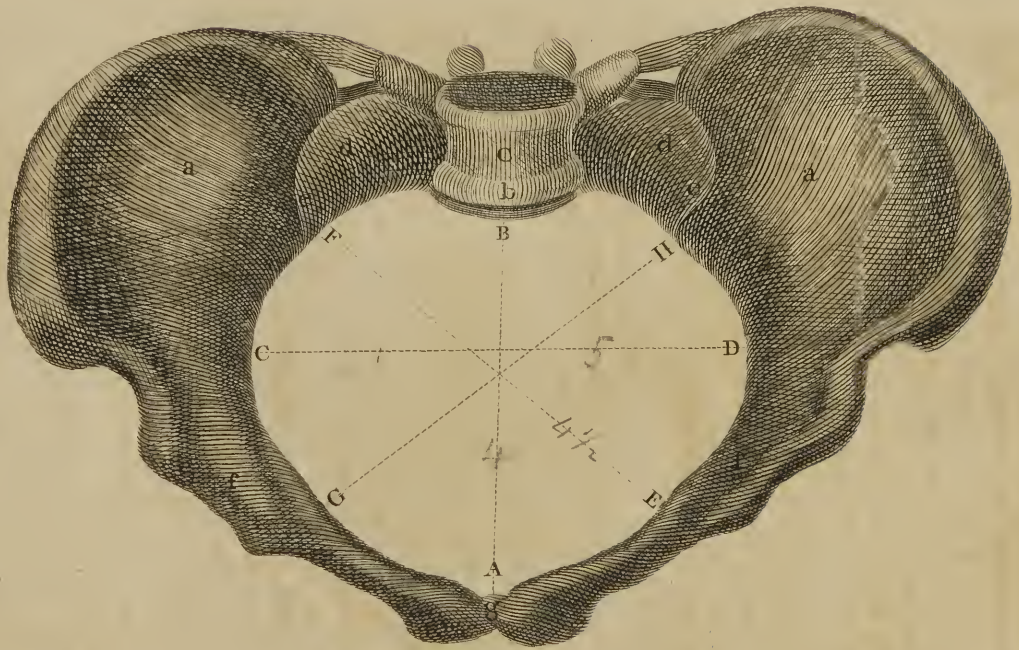
ments, or which could not be overcome by those means without exposing the child to great inconveniences, as I shall remark in the sequel.

81. The middle part of the *pelvis* is a little larger from before backwards than the *straits;* and this disposition, which proceeds from the curve of the *sacrum*, is as favourable to delivery, as the excess or defect of that same curve would be contrary to it. On one side it diminishes the numerous and long continued frictions which the child's head must necessarily undergo, if the *pelvis* were of the same breadth in all its parts; and on the other, it is not less useful in preventing the effects of a long and forcible pressure on the sacral nerves, which a flat form of the *sacrum* would have rendered inevitable during the whole passage of the head.

82. The cavity of the *pelvis* is not equally deep in every part; it is commonly from four to five inches deep behind, three and an half or thereabouts at the sides, and at most eighteen lines before.

83. The arch of the *pubes* does not merit less to be well understood than the parts I have just described, since its form and dimensions may equally influence the mechanism of labour. This arch, rounded at its superior part, and only from fifteen to twenty lines broad, augments insensibly as it descends; so that its sides are more than three inches and an half apart at the bottom, even four inches, if we take the line which is looked on as the transverse diameter of the inferior *strait*, for its base: its height is about two inches.

84. The axis of the *pelvis* is difficult to determine, because the same line cannot traverse the centres of the two *straits:* and, besides, any axis that could be assigned would not be the same in every subject, nor in every attitude of the body.


a
d
c
b
c
d
a
E
B
H
C
D
G
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A

The axis of the superior *strait* seems to be almost as much inclined from before backwards, as the *strait* itself is in the contrary direction: one of its extremities passes under the *umbilicus*, and the other towards the middle and inferior part of the *sacrum*. The axis of the inferior *strait* must be considered, relative to delivery, as passing through the centre of the opening of the *vagina* dilated by the child's head: its direction is then so much inclined from behind forward, that its superior extremity traverses the lower part of the first false *vertebra* of the *sacrum*, and crosses that of the other *strait* at a very obtuse angle.

Explanation of the Second Plate.

This figure represents the entrance or superior *strait* of a well-formed *pelvis*, reduced to the half of its natural dimensions.

a, a, The *iliac fossæ*.

b, The *sacro-vertebral* angle, or the projection of the *sacrum*.

c, The last *lumbar vertebra*.

d, d, The lateral parts of the base of the *sacrum*.

e, e, The *sacro-iliac symphyses*.

f, f, The parts over the *acetabula*.

g, The *symphysis* of the *pubes*.

The lines indicate the different diameters of the *superior strait*.

A, B, The *antero-posterior* or little diameter.

C, D, The transverse or great diameter.

E, F, Oblique diameter, which extends from the left *acetabulum* to the right *sacro-iliac* junction.

G, H, Oblique diameter, which goes from the right *acetabulum* to the left *sacro-iliac symphysis.*

Explanation of the Third Plate.

THIS figure represents the inferior *strait* of a well-formed *pelvis*, reduced to the half of its natural size.

a, a, The external faces of the *ossa ilia.*

b, b, The anterior superior spines of the *ossa ilia.*

c, c, The anterior inferior spines of the *ossa ilia.*

d, d, The *acetabula.*

e, e, The *foramina ovale*, with the obturator ligaments.

f, f, The *ischiatic tuberosities.*

g, g, The *ossa pubis.*

h, h, The branches of the *os pubis* and *ischium* united.

i, i, The *sacrum.*

k, The *coccyx.*

l, l, The *sacro-ischiatic* ligaments.

m, The *symphysis* of the *pubes.*

n, n, The arch of the *pubes.*

The lines indicate the diameters of the inferior *strait.*

A, A, The *antero-posterior* or great diameter.

B, B, The transverse or little diameter.

C C, D D, Oblique diameters.

Plate III.

Of the Deformities of the Pelvis, considered with respect to Delivery.

85. The different states in which the dimensions of the *pelvis* vary so much from those I have just described, as to disturb the natural order of labour, and render it more or less difficult, ought to be accounted so many deformities, if we consider them relative to that function: they all consist in the excess or defect of size in that cavity.

These principal faults may affect all parts of the *pelvis*, or one alone; and often one of these faults is the consequence of another, or arises from the same cause. Their shades are so numerous, that it would be in vain to expect to distinguish them all by the touch. I shall speak here only of those most essential to be known.

86. It seems at first sight that a delivery should be the more fortunate, as the *pelvis* is of a larger size; because the child's head must undergo less friction in its passage, fewer efforts are required to expel it, and the labour is less painful. Although this be generally true, as to delivery, strictly speaking, yet experience has but too often taught that this slender advantage is dearly paid for by lasting inconveniences, either before or after delivery; so that we cannot regard the most spacious *pelvis* as the greatest indulgence of nature, relative to this important function. Women who enjoy a conformation so favourable in appearance, are more exposed than others to the effects of obliquity of the *uterus*, and to its descent; especially in time of labour, when that *viscus*, already charged with the weight of the child, is entirely subjected to the expulsive force of the abdominal muscles. Feebly retained by its liga-

ments, in women who have already had several children, the *uterus* is habitually lower and descends lower still in the subsequent pregnancies, till it be sufficiently developed to rest on the margin of the *pelvis;* which does not take place till after the first four or five months. Before that time it gravitates strongly on the extremity of the *rectum*, and as well by its weight as volume impedes the discharge of the *fæces* and urine, as well as the free course of the blood in the veins which pass through the *pelvis;* which is often the cause of very important accidents. If they partly vanish towards the middle of pregnancy, they sometimes re-appear at the latter end, because the child's head engages early in the *pelvis;* and acts, as it increases, on the same parts, as the totality of the *uterus* did before. If we add to these accidents those which may result from a too sudden and too easy delivery, it will not appear surprising that I should reckon an excess of amplitude in the *pelvis* among the faults in the conformation of that cavity.

87. It is indeed easy to prevent some of these accidents, and to remedy others; but there are some to which we can apply no remedy. We may remedy the descent of the *uterus*, and the accidents which depend on it, by means of a proper *pessary;* we may also keep that *viscus* in its natural position, when it has taken an unfavourable one. We may prevent it from prolapsing in time of labour, by keeping the woman in a horizontal position; by recommending to her not to make the most of her pains, that is to say, not to bear down at all; by supporting the edge of the orifice till the head has cleared it; and taking care that it be not dragged along by the child's shoulders, in extracting the *trunk*.

88. When the neck of the *uterus*, charged with

the child's head, is so far prolapsed that the head appears entirely without the *pelvis*, we must begin by extracting the child, with all possible precautions not to aggravate the evil already existing; and then the *uterus*, diminishing in volume, will easily return. When things are less advanced, we begin by pushing back what is prolapsed, and proceed as directed above; that is to say, we are to support the neck of the *uterus* till the child be disengaged from it.

89. The accidents which have no other remote cause than the too great capacity of the *pelvis*, are in general much less troublesome, and more easy to avoid, than those which arise from the narrowness or defect of size of that canal; this last fault being capable of affecting the lives of both mother and child, by obstructing delivery, or rendering it extremely difficult.

90. The narrowness of the *pelvis*, considered with respect to delivery, ought to be distinguished into relative and absolute. The former arises from the extraordinary size of the child's head, or from its bad position; the latter from the bad conformation of the *pelvis* itself. To fix a just estimate of the various degrees of both these species, and determine the consequences they might produce, it would be necessary to know exactly, *à priori*, the extent of the *pelvis* affected by them, as well as the volume and solidity of the head which must pass through it. As it is impossible to appreciate the size of the latter, I shall suppose it constantly to be three inches six lines in diameter, from one parietal protuberance to the other, in order to establish some general *data*.

91. Absolute narrowness, the only species of which I shall speak here, is rarely found in all parts of the *pelvis* at the same time; in general it affects

but one of the *straits*, and in that case the other is pretty commonly of the natural size, and sometimes a little larger than usual. This fault is more frequent in the superior *strait* than in the inferior; and we observe that it almost always affects the *strait* in its small diameter, and very rarely in the transversal; and sometimes it only affects one side. We remark the contrary in the inferior *strait;* for there it is generally caused by the approximation of the *tuberosities* of the *ischia.*

92. It is easy to determine why the superior *strait* is oftener deformed than the inferior; and why it is almost always between the *pubes* and *sacrum* that it is defective respecting delivery. If we consider the direction of the forces which act on the *pelvis* in rickety children, in whom the bones are at the same time softer and more loosely connected than in the natural state, we shall see that the greater part of those forces tend to carry the base of the *sacrum* forward, and the *ossa pubis* backward. Whether the child be standing or sitting, if we attend to the direction of the spinal column we shall see that the weight of the body must insensibly push the base of the *sacrum* towards the *pubes;* and that it acts in the same manner on the inner parts of the *acetabula*, which serve as a *fulcrum* to the inferior extremities, when the child is standing or walking. The *ossa pubis*, particularly in these latter cases must be pushed towards the *sacrum;* but in such a manner, however, that their posterior extremities often approach a little nearer to the projection of the base of that bone than their anterior extremities, or the *symphysis.* If the superior *strait* does not constantly present the same figure in deformed *pelves;* if it is sometimes larger on one side than the other; if one of the *acetabula* is nearer to the *sacrum*, while the

other approaches less; if the *symphyses* of the *pubes* is removed in many cases, from a line which would divide the body into two equal parts—it is because the rickets has not equally affected all the bones of the *pelvis*, nor equally hurt all their junctions; and because the attitude which the child takes in walking or sitting may change a little the direction of the compressing powers which I have just mentioned. The weight of the body may also equally hurt the form of the inferior *strait*, but variously, according to the most usual attitude of the child, and the direction taken by the spinal column. For example, if it sits much, the *sacrum* will be more curved, and the *strait* more contracted from before backwards; in this attitude if it inclines habitually to one side, one of the *ischiatic tuberosities* will be thrown inwards, the *os ilium* will be more elevated, &c. The action of the muscles which are attached to the *pelvis*, the pressure of clothes, and that which the arms of the nurse exert on this part, contribute also something to the deformities in question, but much less than the weight of the trunk: whence we see of what importance it is to keep rickety children in bed, and leave them at liberty; instead of obliging them to walk, to sit up, or have them constantly in the arms, as is done almost every where.

93. The deviations of nature do not present fewer varieties in the dimensions of the *pelvis*, than in the *contour* of its *straits*. If the diameter of some, considered from the *pubes* to the middle of the projection of the *sacrum*, is only defective a few lines; in others the defect is of several inches, so as scarcely to leave one between those two bones. The intermediate degrees are more frequently found than these two extremes; and the latter of them is never so great in the inferior *strait* as in the superior. I have seen

pelves in which the distance from the *pubes* to the *sacrum*, superiorly, was but from six to eight lines. I have one in which it is only between three and four lines from the back of the right *acetabulum* to the projection of the *sacrum;* and in another, which is likewise in my collection, that projection is fourteen lines distant from the *symphysis* of the *pubes*. There are no examples of the inferior *strait* being ever so contracted: that related by M. *Herbiniaux*, a surgeon of Brussels, Observation VII. being contradicted by the fact itself; since the woman was in her sixth labour, and he delivered her by means of the *lever*. To assert that, in such a case, the *sinus* formed by the branches of the *ossa pubis* and the *tuberosities* of the *ischia*, was but half an inch wide, is displaying more than ignorance.—See the work of that surgeon, p. 264, &c.

94. If we compare the dimensions of a child's head with those of a well formed *pelvis*, we shall see clearly that the latter might have some inches less in its circumference, and yet be large enough for an easy delivery: a common-sized head, when it passes through that canal, presenting a circumference of no more than ten inches and a quarter, or ten and a half, only requires a passage of that size. Proceeding on this principle, we must fix the first degree of narrowness of the *pelvis* at something less than three inches and a half for each diameter, but especially for the smallest, as well of the superior as of the inferior *strait;* and the other degrees, from that, down to the one I mentioned in the preceding paragraph.

95. The difficulty of delivery, all things besides being well disposed, and the child's head of the usual solidity, is in general so much the greater, as the narrowness of the *pelvis* is more considerable.

When this vicious conformation leaves an opening of but three inches and a quarter, delivery becomes so much the more tedious and painful, in proportion as the frictions which the child's head must undergo in passing through the *pelvis* are more numerous and strong. If the obstacles are more considerable when the *pelvis* has but three inches in the little diameter, yet they are not even then always insurmountable by the natural agents of delivery; and the woman may still be delivered without help, notwithstanding the apparent disproportion which exists between the diameter of the child's head and that of the *pelvis:* the woman may enjoy the same advantage even when the little diameter is but two inches and three quarters, as I have seen several times. These natural labours ought only to be considered as exceptions to the rule: the uncommon suppleness of the bones of the child's *cranium* having favoured the lengthening of the head, and the change necessary for its passage.

96. Examples still more extraordinary come to the support of these; and show us that nature is sometimes able, by new deviations, to prevent the disagreeable consequences which might arise from a deformity of the *pelvis:* a suppleness of the *cranium*, greater still than that I have just mentioned, having procured to some women the good fortune to be delivered without help, and with as much facility and success, although their *pelvis* had but two inches and a half in the little diameter of its entrance. M. *Solayres* observed, in a case of this kind, that the head was lengthened in such a manner, that its longest diameter was eight inches all but two lines; that which goes from one *parietal* protuberance to the other, being reduced to two inches five or six lines. I have seen similar changes

in the form of the head, and the respective length of its diameters at the instant of birth, where the woman was equally deformed; the great diameter being seven inches, and the transverse thickness of the *cranium* two inches six or seven lines. These children were in good health, and the day after their births their heads wanted very little of being of the dimensions usual at that time. The history of the section of the *pubes* furnishes us with more convincing proofs of the possibility of a natural delivery, in cases where the *pelvis* has but two inches and a half in the little diameter of the brim. The woman who was cut by M. *de Matthiis*, the 17th April, 1785, was delivered successfully, and without much difficulty of her first child nine years before, although her *pelvis* had but that diameter.*

97. When the *pelvis* is so much contracted as to have less than two inches and a half in the little diameter, a child at full time cannot pass it. The Cesarean operation, the section of the *pubes*, and premature delivery, have been recommended in these cases; but the first is the only one which surgery has authorised: we shall see in the sequel what we ought to think of the second; and of premature delivery, which the laws proscribe entirely.

98. Though the woman may sometimes be delivered naturally, when the contracted *pelvis* has no more than two inches and an half in the little diameter, it is not always without danger to her and to the child. On one side, the soft parts which line the *pelvis* being subjected to a strong pressure, even to a kind of contusion, inflame, become painful, and are threatened in the sequel with suppuration and gangrene. On the other side, the bones of the child's

* See the article on the section of the *pubes*.

cranium riding one over the other, or being fractured and depressed, compress or wound the brain, which causes it to become plethoric, and produces internal extravasations, which are generally mortal.—See the chapter on the locked head, and the manner of using the forceps.

99. The obstacles which are produced by a deformity of the *pelvis*, and the accidents which result from it, show themselves sooner or later, according as it is the superior or inferior *strait* which is vitiated. When they are both so, those obstacles manifest themselves as soon as labour begins; and very often the expulsive powers are so exhausted by exerting themselves against the obstacles produced by the superior *strait*, that the head stops there; or else, having been pushed into the cavity of the *pelvis*, and not being able to advance any farther, remains fixed, till the exhausted, or only weakened, forces of the woman be sufficiently recruited to expel it, unless art come seasonably to her aid. The head cannot clear the first *strait* without lengthening from the *occiput* to the chin, and diminishing in thickness from one *parietal* protuberance to the other; and without the *parietal* bones crossing each other at their superior edges, as well as the other bones of the *cranium;* nor without producing a tumefaction in that part of the teguments of the *cranium* which answers to the void of the *pelvis*, and an *engorgement* of the brain; and, lastly, without strongly compressing and bruising the soft parts which line the *strait*. Being got into the cavity of the *pelvis*, and finding itself in a larger space than the *strait* which it had just cleared, the child's head is restored more or less to its natural state, according as it sojourns there a longer or a shorter time; and departs in the same degree from the form it had acquired in the

first period, and which is still necessary to enable it to pass the inferior *strait*. The symptoms which had manifested themselves, as I may say, with the first pains, sometimes disappear, more or less, during the stay of the head in the excavation; but reappear, and increase anew, when the labour comes on again with force.

100. When the superior *strait* alone is contracted, the child's head at first advances with great difficulty; but as soon as the *parietal* protuberances have cleared the *strait*, the other parts of the *pelvis* being relatively or absolutely larger, the head passes them with so much ease, that frequently a few pains suffice to terminate the delivery.

101. We observe the contrary when the inferior *strait* is vitiated, if the first is of the usual size. The head descends easily into the lower part of the *pelvis*, but can proceed no farther till it overcome the obstacles which obstruct its course, and render it as difficult as laborious. The symptoms which I have just mentioned in paragraphs 98 and 99, manifest themselves later in this than in the preceding case.

102. The accoucheur who has not yet by long practice enabled himself to form a just estimate of the powers of nature, may easily deceive himself in these cases; and, in the first, judge a delivery to be impossible which is ready to terminate; and, in the second, declare that to be easy which is just going to be opposed by difficulties that art alone can surmount, or which at least render it extremely tedious and painful. I shall not here collect observations to give more force to these truths: authors might have furnished a great number of them, if they had mentioned all the errors they have committed in such cases. More than forty persons

were witnesses to the disagreeable consequences of a mistake of this kind, in a woman whose *pelvis* I have long had by me. The operator having pronounced that the woman would be speedily delivered, on account of the facility with which the child's head had engaged with the first pains—and attributing the obstacles which soon after obstructed its passage to another cause, and not to the narrowness of the inferior *strait*, which had not been noticed—waited two days in perfect security; and then, by a more blind temerity than the former, used a crotchet on a child whose life might by other means have been preserved. The superior *strait* of the *pelvis*, divested of all its coverings, presented a circumference of fourteen inches, in a circular form, while the inferior *strait* had but nine; the distance from the point of the *sacrum* to the *symphysis* of the *pubes*, as well as the interval between the *ischiatic tuberosities*, was but three inches. The cavity of this *pelvis* diminished insensibly in breadth from one *strait* to the other, and was as regular as possible in its *contour*.

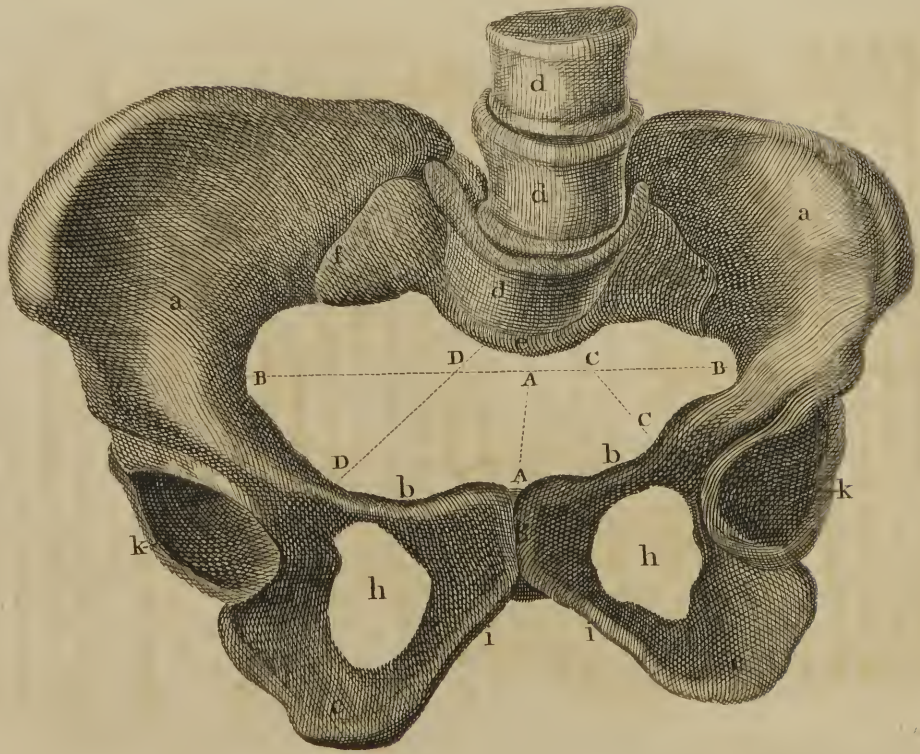
103. The middle part, or excavation, of the *pelvis*, is much seldomer defective than the *straits;* and, when it exists, must arise from some *exostosis*, or from the *sacrum's* describing a *straight* line in its anterior part, instead of being curved as usual. This defect in the cavity can produce no other effects than those which have just been described.

A straight and flat form of the *sacrum*, in general, produces fewer obstacles to delivery than the too great curve of that bone. The former fault commonly only affects the cavity of the *pelvis;* which cannot hinder the passage of the child, if the canal be otherwise well disposed: whereas the latter, or too great curve of the *sacrum*, generally injures the

two *straits*, and contracts them from before backward, at the same time that it diminishes the depth of the *pelvis* posteriorly, and the respective height of the arch of the *pubes*. The child's head, after having with difficulty cleared the first *strait*, in these cases, cannot pass the other; because it is stopped in its course by the inferior part of the *sacrum*, before the *occiput* is low enough to engage under the arch.

104. A too great length in the *symphysis* of the *pubes*, a want of elevation or breadth in the arch of those bones, the length and wrong direction of the *ischiatic* spines, as well as a consolidation of the *coccyx* with the point of the *sacrum*, may also render labour difficult, in the same manner as is done by the excessive curve and shortness of the *sacrum*. Besides that these latter faults are very rare, if we except the consolidation of the *coccyx*, I must observe that they are scarcely ever met with alone, and that they are generally the consequence of a bad conformation of the rest of the *pelvis*.

105. If the intimate consolidation of the three pieces which constitute the *coccyx*, or of the *coccyx*, with the *sacrum*, be more common than the other faults, yet it cannot obstruct delivery so often as has been thought; and, if it sometimes does, it is only in women who have also a narrow *pelvis*. Those who have assured us that, in all cases, the point of the *coccyx* is pushed back half an inch or even an inch, by the child's head, knew not the relation between the dimensions of that head, and those of the inferior *strait*, in most women; for they might have seen that the diameter, measured from the extremity of that appendix to the inferior edge of the *symphyses* of the *pubes*, was absolutely greater than that which the head presents in that direction, when


d
d
d
a
a
f
D
C
B
A
B
C
D
b
A
b
k
k
h
h
i
i
c
c

it disengages from the *pelvis*.—See the mechanism of natural labour.

We cannot then recommend the precept laid down by some, on account of the consolidation of the *coccyx* with the *sacrum*,* without exposing the greater part of those who practise Midwifery to the abuse of it; generally this consolidation has been blamed for what was merely the effect of the resistance of the external parts.

Explanation of the Fourth Plate.

This figure represents a deformed *pelvis*, of which all the parts are reduced to half their natural size.

a, a, The *ossa ilia*.

b, b, The *ossa pubis*.

c, c, The *ossa ischia*.

d, d, d, The last *lumbar vertebra*.

e, The projection of the *sacrum*.

f, f, The *sacro-iliac symphyses*.

g, The *symphysis* of the *pubes*.

h, h, The *foramina ovalia*.

i, i, The branches of the *ossa pubis* and *ischia*, which form the anterior arch of the *pelvis*.

k, k, The *acetabula*.

The lines indicate the diameters of the superior *strait* of this *pelvis*.

A, A, The *antero-posterior* diameter; its natural length is fourteen or fifteen lines.

B, B, The transverse diameter; its natural length is four inches ten lines.

* This precept advises pushing back the *coccyx*, when the head, though low down, cannot disengage itself easily.

C, C, The distance from the projection of the *sacrum*, to that point of the margin which answers to the left *acetabulum*, thirteen lines.

D, D, The distance from the same point of the *sacrum*, to that of the margin which answers to the right *acetabulum*, twenty lines.

I have another *pelvis*, which has an opening of between three and four lines only in the direction of this last line, and an inch and an half from the middle of the projection of the *sacrum* to the *symphysis* of the *pubes*.

The inferior *strait* in both these *pelves* is very large.

Explanation of the Fifth Plate.

This figure represents a deformed *pelvis*, in which the parts are reduced to half their natural size.

a, a, The *ossa ilia*.

b, b, The *ossa pubis*.

c, c, The *ossa ischia*.

d, d, d, The last *lumbar vertebra*.

e, The projection of the *sacrum*.

f, f, The *sacro-iliac symphyses*.

g, The *symphysis* of the *pubes*.

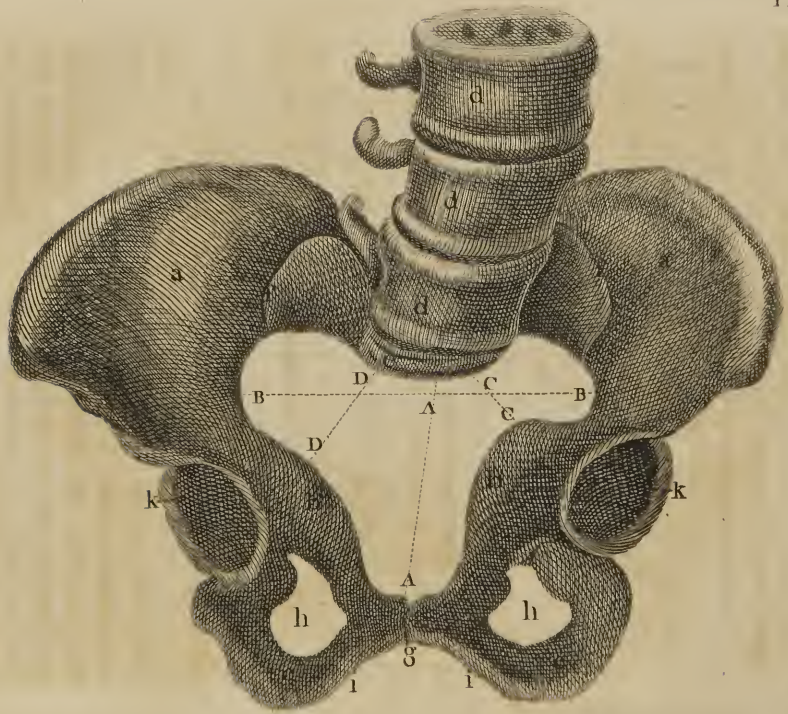
h, h, The *foramina ovalia*, seen obliquely.

i, i, The arch of the *pubes*, seen in the same manner.

k, k, The *acetabula*.

The lines indicate the different dimensions of the superior *strait*.

A, A, From the *pubes* to the projection of the *sacrum*, in the natural state of this *pelvis*, two inches two lines.


d
d
d
a
D
C
B
B
A
c
D
k
k
A
h
h
g
l
l

B, B, The transverse diameter, three inches eight lines.

C, C, From the middle and left side of the projection of the *sacrum*, to that part of the margin which answers to the *acetabulum* of the same side, between six and seven lines.

D, D, From the middle and right side of the projection of the *sacrum*, to that part of the margin which answers to the right *acetabulum*, one inch two lines.

This *pelvis* was taken from the cabinet of M. *Riel.* The subject was a woman of twenty-seven years.

Of the Soft Parts connected with the Pelvis.

106. The accoucheur would have but an imperfect knowledge of the *pelvis*, if, after having studied it in the skeleton, he should not consider it in conjunction with the soft parts which surround it on all sides; since some of these latter cause great changes in its form and dimensions; and it is only by a knowledge of the situation, the connexion, and uses of others, the change of place, and the constraint or compression which they suffer during pregnancy, that he can explain the greater part of the phenomena which occur in that period, and during labour.

107. The *pelvis*, making part of the abdominal cavity, is bounded superiorly by the *diaphragm*, which separates that cavity from the breast; behind, by the spinal column, the *quadrati* muscles, and others; before, and at the sides, by the abdominal muscles, &c. These latter have too much influence

on the mechanism of labour, for us not to take notice, at least, of their principal attachments, and the relation which they have to each other.

108. Of these muscles, which are ten in number, eight are attached to the breast, and to the superior edge of the *pelvis;* that is to say, the oblique, the transverse, and the *recti.* The two oblique and the transverse, on each side, extend from the last true ribs, and from all the false ones, to the *cristæ* of the *ossa innominata*, forming three distinct planes by the direction of their fibres: those of the external plane descending more or less obliquely from behind forwards; those of the second ascending from before backwards; and the fibres of the third going transversely, in the manner of a girdle. Each of these muscles terminates in a broad *aponeurosis* at its anterior part. The *aponeurosis* of the external oblique, passing from the anterior superior spine of the *ilium* to the angle of the *pubes*, forms *Poupart's* ligament, and the inguinal ring; that of the internal oblique divides into two layers, one of which unites itself intimately to the *aponeurosis* of the former, and the other to that of the transverse muscle. In the sheath formed by this partition are found the *recti* muscles, at least the superior two thirds of their length. These muscles descend in parallel lines from the anterior and inferior part of the breast to the anterior extremity of the body of the *ossa pubis*. They are thinner and broader above than below. Their inferior extremity is applied immediately to the *peritoneum*, and is covered externally by the pyramidal muscles, which ascend from the angles of the *ossa pubis* to the *linea alba*.

109. The *linea alba* is the space which separates the *recti* muscles; it is a kind of band, formed by the junction of the *aponeuroses* of the oblique and

transverse muscles of each side; but whose fibres are so crossed and interwoven, that those of the external oblique muscle of the right side, for example, seem continued with those of the internal oblique of the left side, &c. This band is broader above the *umbilicus* than below, and extends from the bottom of the *sternum* to the top of the *symphysis* of the *pubes*. Its breadth constantly augments in the course of pregnancy, in proportion as the volume of the *abdomen* is developed; towards the end of it, the *recti* muscles are considerably separated from each other, especially at the height of the *umbilicus;* and sometimes the umbilical ring is singularly open. We observe also that the *linea alba* is then very thin; and that its separated fibres leave in many places considerable meshes, which have sometimes given birth to certain *hernias*. The abdominal muscles, independently of their uses relative to the motions of the breast on the *pelvis*, and of the *pelvis* on the breast, exert their action on the *viscera* of the *abdomen*, and especially on the *uterus* in time of labour, to which that action singularly contributes.

110. In order to mark the place which nature has designed to each of the *viscera* of the *abdomen*, of which I shall here only enumerate the names, it is proper to recollect the names of the different regions of that cavity. We reckon three principal ones: *viz.* one superior, called the *epigastric;* one middle, the *umbilical;* and one inferior, the *hypogastric:* we may estimate the extent of them by drawing two transverse lines from one side of the *abdomen* to the other, at two fingers' breadth above and below the *umbilicus*. Each of these regions is subdivided into three others; one middle, which is called the principal

region; and two lateral, known by the names of *hypochondres*, lumbar and iliac regions.

111. The *stomach*, the *liver*, the *spleen*, the *duodenum*, and the *pancreas*, occupy the first of these principal regions; the greater part of the small intestines, the *colon*, almost the whole of the *omentum*, the *kidneys*, and their dependencies, are situated in the second. The other contains the *cæcum;* a portion of the *ilion* and of the *colon;* some of the parts of generation; and others which, having a more immediate relation to the *pelvis*, require a particular detail.

112. We find two muscles at each side of the *pelvis* internally; the *iliacus* and the *psoas*. The former, whose fibres are as it were radiated, covers the *iliac fossa;* and the other descends from the lateral part of the lumbar column, over the side of the superior *strait* and above the *acetabulum*, where they join and unite themselves strictly, to be inserted together into the little *trochanter:* the *psoas*, in this course, narrows at the entrance of the *pelvis* a little transversely, as I have already observed. We sometimes meet with a third muscle, *psoas parvus;* it lies along the internal edge of the *psoas*, and is terminated by a flat *tendon* at the posterior extremity of the eminence, called *ilio-pectineus*.

113. Behind, and in the substance of the *psoæ* muscles, are found the nerves which form the *obturator* and the *crural*, as well as other branches furnished by the three first pair of *lumbar* nerves, especially by the first; which, following a different course, are lost in the teguments of the groins, and parts adjacent. I think it is to the distension and stretching which these subaltern branches and their ramifications undergo, by the augmentation of the volume of the belly, that we are to attribute the

troublesome pains which women feel about the *pubes*, in the groins, and in the small of the back, in the latter periods of gestation; especially when they are standing still, or kneeling, &c. So also we must attribute to the compression which the *crural* and *obturator* nerves suffer before their exit from the *abdomen*, that weakness of the inferior extremities, which makes most pregnant women so apt to fall on their knees, or the breech, and makes their gait so unsteady; for these accidents cannot depend entirely on the alteration of the centre of gravity during pregnancy. We know that the *obturator* and the *crural* nerves are formed by the union of several cords which are derived from the second, third, and fourth pair of *lumbar* nerves; that the *obturator* goes out of the *pelvis* at the posterior and superior part of the *foramen ovale*, to be distributed to the muscles of the inside of the thigh; that the *crural* passes out under the *ligamentum Fallopii*, where it divides into a great number of branches, some of which go as far as the foot.

114. Before the last *lumbar vertebra*, and frequently before the fourth, we remark the *bifurcation* of the *aorta*, and of the *vena cava* inferior; and soon after the division of each of these branches, known by the name of primitive iliac arteries and veins, into two others. One of these latter goes to the inferior extremities, along the internal edge of the *psoas* muscle; and the second descends into the *pelvis*, to rise again at the side of the bladder and *umbilicus*, forming a curve from which arise the *obturator* vessels, the *glutei*, the *sciatica*, and the *pudica communia*. The first of the two branches of the primitive *iliac* arteries, is called the external *iliac*, or *crural;* the second, the internal *iliac*, or *hypogastric*. The veins are distinguished by the same names.

115. The *rectum* is not the part least remarkable among those I propose to mention. Its situation at the left side of the projection of the *sacrum*, and that of the Roman S of the *colon*, of which it is the continuation, as well as the volume which it acquires by the accumulation and retention of the excrements, produce effects which have often been attributed to causes which had nothing to do with them; such as a lateral obliquity of the *uterus*, &c. This intestine is bound to the *sacrum* by a very loose cellular tissue, in which we mark the *sacral* and *hæmorrhoidal* vessels, the extremity of the great sympathetic nerves, and especially the *sacral* nerves.

116. These latter, to the number of five pair, pass out of the canal of the *os sacrum*, through the holes which have already been remarked in its interior face. The three first pairs, with a cord from the two last *lumbares*, are almost entirely employed in forming the *sciatic* nerves, which are distributed through the whole extent of the inferior extremities, after passing out of the *pelvis* at the *ischiatic* notch. The fourth and fifth pairs go only to the parts within the *pelvis*, to some of the muscles which surround it, and to the external parts of generation.

117. It is to the compression which the child's head, on certain occasions, exerts on these nervous cords at their exit from the *sacral* holes, that we must attribute the painful cramps, and the convulsive trembling, of the inferior extremities, which sometimes so cruelly torment women in time of labour; as well as the sensation of numbness and weakness which they often feel in those parts.

118. At the sides of the *pelvis*, and behind, are found the two pyramidal muscles of the thighs, the

sacro-ischiatic ligaments, and the *ischio-coccygei* muscles. A little forwarder are the *levatores ani*, which embrace the neck of the bladder by their anterior edge, and the extremity of the *rectum* by their lower parts. Lastly we find here the internal *obturator* muscles.

119. Behind the *ossa pubis* is the urinary bladder, with the canal of the *urethra*. Towards the latter end of gestation it is almost always found entirely above those bones; and the *urethra* then becomes parallel to their *symphysis*.

120. In the middle of the *pelvis* is situated the *uterus* and its dependencies, of which I shall speak presently; and the whole is covered by the *peritonæum*.

121. A great number of muscles, of which some belong to the thighs and legs, others to the back, loins, and arms, are attached to the outside of the *pelvis*. These muscles, and much more those of the *abdomen*, by acting on the *pelvis*, and drawing it sometimes to one side and sometimes to the other, according to circumstances, may change the direction of its axis a little, relative to that of the body; and may in another manner also affect the mechanism of delivery.

122. The teguments and the cellular membrane, more or less loaded with fat, according to the lustiness of the woman, form a common covering to the hard and soft parts which we have comprised under the name of *pelvis*. But this covering is not equally thick in all parts, because the *subcutaneous* cellular membrane is closer in some parts than in others, and cannot admit there the same quantity of adipose juices. We observe, for example, that the cellular membrane is always pretty thin behind, in the places which answer to the spiny *tubercles* of

the false *vertebræ* of the *sacrum*, whatever may be the lustiness of the subject. We know that the teguments present several large openings on the outside of the *pelvis*, as the *anus* and the *vulva*, as well as plaits in form of furrows at the groins and under the *nates*. These plaits are more or less profound or superficial, according as the thighs are bent or extended. In an extreme flexion of these extremities the plaits of the *nates* are effaced; and if we then separate the knees, as most women do when the head is ready to be delivered, the *perinæum* becomes extremely tight; which renders the development of that part more difficult, as well as that of the *vulva*; and retards delivery, at the same time exposing the *fourchette* and the *perinæum* itself to be more torn. We see, according to this observation, that we ought at that moment to keep the woman's thighs, at most, moderately bent and separated, &c.

Of the Examination necessary to discover whether the Pelvis is well or ill formed.

123. No one can be acquainted with certain fundamental truths of the art of Midwifery, without knowing all the importance of this examination: but its difficulties are only perceived by those obliged to make these researches; and a frequent exercise on the dead body can alone smoothen a part of the obstacles we meet with in it.

124. If accoucheurs had applied themselves more to these examinations; if they had earnestly demonstrated all the necessity of it, with respect to deformed women; and if those women had submitted

to it before they engaged in marriage, we should probably still have been ignorant of those sad resources of our art, which have had so many victims for a few mothers and children which they have saved from certain destruction. What woman would have purchased the title of mother so dear, if she had been assured that in becoming pregnant she could have no resource but in the Cesarean operation, or in the section of the *pubes?* what woman would have consented to the sacrifice of her child, to save her from these operations? and who would have wished to taste the sweets of hymen at that price?

125. In whatever point of view we place this object, it will appear equally important: whether the question be of a young woman, whose external deformity gives occasion to fear concerning the state of the *pelvis;* or of a married woman ready to lie in, or whose labour is begun—the accoucheur becomes, in some sort, the arbiter of her destiny; and his decision may affect the life of one or of several individuals. The more distressing the consequences of such an examination may prove, the more care and skill we ought to exert in making it. All who practise the art of Midwifery have not the knowledge necessary to estimate the degree of defect in the form and dimensions of the *pelvis.* It cannot be determined by inspecting the spinal column; nor by the irregularity of the inferior extremities, and the gait of the woman; nor by the time at which the deformities of all these parts were manifested. On one side, the cause of these deformities does not always affect the form of the *pelvis* so as to render delivery impossible, or even difficult; and, on the other side, we have seen these deformities manifest themselves in infancy, disap-

pear in youth, and the *pelvis* alone retain the impressions of the rickets which had produced them: so that many crooked women may be delivered naturally; while others, who enjoy the finest external proportions, cannot have the same good fortune, the narrowness of the *pelvis* producing obstacles insurmountable by the common agents of delivery. There is no rock on which these external appearances, favourable or unfavourable, have not thrown the unskilful practitioner. His security, in some cases where he had persuaded himself that the *pelvis* was well formed, has suffered some women and and children to perish in the continued exertion of impotent efforts, who could not possibly have been saved but by the forceps, or the Cesarean operation; while the disadvantageous opinion which he had conceived of that cavity, in other cases, has led him to employ those means in circumstances that only required a little dexterity on his part. It is not only the forceps which have been abused in these latter cases, but the Cesarean operation, and much more still the section of the *pubes:* alarming truths, which it gives me pain to mention.—A few years ago I preserved a woman from the Cesarean operation, the diameter of whose *pelvis* had been estimated at only one inch and a quarter by the accoucheur she had employed: we waited four hours for the favourable moment to operate; the apparatus was prepared; the woman was ready to place herself on the couch; twelve or fifteen persons, as well physicians as surgeons, were going to be witnesses of this afflicting scene; when touching the woman for the first time, I declared strenuously that she would be delivered naturally, and without difficulty; as actually happened two hours afterwards, and the child was strong and healthy.

126. The consideration of the external form of the *pelvis* may be very useful to us in the examination which I am going to describe: for the negative signs of a good conformation are so many indications of a bad one; and both the one and the other have, besides, external marks which enable us to judge of the cavity and internal form of the *pelvis*. The roundness of the hips; their quality, as well in height as in breadth; the convexity of the *pubes;* the superficial depression of the superior and posterior part of the *sacrum;* an extent of four or five inches from the centre of that depression to the extremity of the *coccyx;* a thickness of seven or eight inches in women moderately lusty, from the point of the spiny *tubercle* of the last *lumbar vertebra* to the middle of the *mons veneris;* and a distance of eight or nine inches between the anterior superior *spines* of the *ossa ilia;* characterize a good conformation. An irregularity of the hips, whether in their roundness or elevation; a distance much smaller than that which I have assigned between the superior anterior *spines* of the *ossa ilia;* a too high or too flat form of the *pubes;* too deep a fall in the small of the back; a great convexity of the *sacrum* behind; an inflection of the *lumbar* column to one side or the other, &c. denote a bad conformation.

127. The superior *strait* is contracted between the fore and back parts, whenever the *pubes* is less salient than common, and the posterior and the superior parts of the *sacrum* more sunk in. The inferior *strait* is also contracted in that direction, when the point of the *sacrum* and the *coccyx* are carried inwards; and it is larger, when that appendix is thrown backwards or outwards.

128. When the first of these *straits* is vitiated transversely, the region of the *pubes* is salient, in-

stead of being flattened, as in the preceding case; the anterior part of the *pelvis* forms an obtuse angle, and not that circular figure which characterizes a good conformation; and often one of the groins appears more sunk in than the other. If it is more difficult to form a judgment of a narrowness which affects but one side of this *strait*, so also it gives less obstruction to delivery than that which I have just mentioned.

129. But these general notions are still insufficient, and cannot enable us to determine the degree of opening which a deformed *pelvis* presents interiorly. However experienced we may be, the application of the hands externally will never inform us sufficiently to determine the choice of the means proper to be used for terminating the delivery in difficult cases. If we cannot any other way acquire a knowledge of all the diameters with a mathematical precision, at least we come near enough to prevent our committing any capital mistakes. It is easy, especially, to determine the length of that diameter of the superior *strait* which goes from the *pubes* to the *sacrum*, the only one which is generally defective respecting delivery. Many instruments are used for measuring it, which are so many kinds of compasses, some of which are developed within the *pelvis*, and some without; I prefer one of these latter, which I call *compas d'epaisseur* (calipers,) not only because its application is more easy, but also because there is nothing in it painful or fatiguing to the woman; and because it may be applied at all times, and on all kinds of subjects; and because the result of it has appeared to me more certain.

130. To determine how much the superior *strait* is defective in the aforesaid diameter, and measure

it by means of these compasses, we take the thickness of the woman from the middle of the *mons veneris* to the centre of the depression of the base of the *sacrum* posteriorly, by applying one of the points of the instrument before, against the *symphyses* of the *pubes;* and the other behind, a little under the spine of the last *lumbar vertebra;** and deduct three inches from that thickness, in women who are thin, for the base of the *sacrum* and the anterior extremities of the *ossa pubis:* the thickness of these latter being at most but six lines, and that of the base of the *sacrum* two inches and a half; and so constantly so, that I have not found a difference of a line in about five and thirty *pelves*, distorted and contracted in all manner of ways, and in all possible degrees. This subtraction of three inches from the external thickness of the *pelvis*, in the said direction, is also sufficient where the lustiness is moderate; and we may add one or two lines more when it is excessive, because the fat which forms the *mons veneris* easily shrinks under the lenticular extremity of the leg of the compasses. The result of this procedure is so exact, that the *pelvis*, measured with the common compasses after opening the body, was not above a line over or under my estimation in any one of my experiments. A greater precision, if we could obtain it, would be useless; since the choice of the most proper methods for terminating the delivery in a given case, cannot depend on a line more or less in the diameter of the *pelvis*. According to these *data*, the knowledge of this diameter is easily obtained. It is four inches, when the external thickness of the *pelvis* measures seven; it is but three, when the latter only measures six; and

* See the Sixth Plate.

but two, when it does not exceed five, &c. I suppose the woman to be thin, as most of those are who have been rickety.

131. The compasses whose branches are developed within the *pelvis*, have often presented a result not very exact; and more than once the error has been of several lines over or under the product they had given, as well because it is difficult to keep one of the branches on the centre of the projection of the base of the *sacrum*, while the other is placed behind the *pubes;* as because the soft parts which line the *pelvis* obstruct their development: their use, besides, is always accompanied with pain, which excites the action of those same parts. We cannot make use of them in young girls, concerning whom their doubtful parents may consult us before marriage; nor even in married women, except in time of labour.

132. The fore finger likewise introduced into the *vagina*, and properly directed, may equally serve to make known the length of the little diameter of the superior *strait;* and the knowledge of it is the more easy to obtain, as the *pelvis* is more contracted. We advance the extremity of this finger to the middle of the most projecting part of the base of the *sacrum*, near its junction with the body of the last *lumbar vertebra;* and, by raising the wrist, we apply the radial edge of the same finger to the inferior edge of the *symphysis* of the *pubes*. We mark on that finger, with the nail of the fore finger of the other hand, the point immediately under the *symphysis;* then, withdrawing from the *vagina*, we measure the length from that point to its extremity. This measure, which is that of the line which descends obliquely from the middle of the projection of the *sacrum* to the inferior edge of

the *symphysis* of the *pubes*, is commonly half an inch longer than the diameter of the superior *strait*, measured from the same point of the *sacrum* to the top of the said *symphysis*. An accoucheur well versed in these examinations, cannot be deceived by this method above a line or two, at most, whatever may be the form or the degree of opening in the *pelvis;* which cannot lead him into the commission of any capital faults in practice.

133. We cannot come near the same precision in the estimation of the other diameters, except that of the inferior *strait* which goes from the *pubis* to the *coccyx;* but we may estimate them well enough not to be grossly deceived in the choice of the methods to be employed for terminating the delivery. Though the external dimensions of the *pelvis* cannot demonstrate the transverse diameter of the superior *strait*, and though the finger introduced into the *vagina* cannot measure that diameter, we may judge of its length with respect to delivery by that of the former. When that which goes from the *pubes* to the *sacrum* is so small that great obstacles result from it, it is excessively rare for the other to be so at the same time; and more rare still for the latter to be defective when the former is of the requisite length. If we measure the transverse diameter from one *iliac* notch to the other, that is to say, between the most distant points of the superior *strait*, we shall never find it less than four inches, whatever may be the length of the diameter which goes from before backward; but this transverse line, the most extensive which we can find in the superior *strait*, must not be looked on as the diameter of that *strait*. Far from passing through the centre of that opening, we observe that it in a manner touches the *sacrum*, in the greater part of

deformed *pelves*, and that in many it passes under the projection of the base of that bone. If the transverse diameter were to be measured from one side of the superior *strait* to the other, at equal distances from the projection of the *sacrum* and the *symphysis* of the *pubes*, it would be always shorter than what I have assigned, but nevertheless always greater than the *antero-posterior* diameter.

134. We discover the extent of the diameters of the inferior *strait*, within a very trifle, by feeling externally till we can clearly distinguish the *ischiatic tuberosities*, the point of the *coccyx*, and the inferior edge of the *symphyses* of the *pubes*. Though it is easy to distinguish these two latter points while the subject is standing, and to judge of their distance, it is not so with the former, on account of the great number of muscles which are attached to them, and the direction of those muscles: but we discover the *tuberosities* in question, we render them somewhat more salient, and evidently more palpable, by giving the thighs of the subject an extreme flexion. If then we want to estimate the distance from one of these *tuberosities* to the other, the woman must be sitting, or, as it is vulgarly called, squat; that is to say, in such an attitude that the legs and thighs may be bent. It is by the distance between the fingers which touch the *ischiatic tuberosities*, that we judge of that between them; but the diameter which we propose to measure thus, is always two or three lines shorter than the external measurement; and sometimes five or six lines, when the bones are very thick.

135. As often as the condition of the subject to be examined permits us to pass the finger into the *vagina*, we ought to do it; we might even introduce the whole hand into it, if necessary, and circum-

stances were sufficiently favourable to permit it; as, for example, in time of labour. This procedure conducts us more surely still to the knowledge of the *pelvis*, since it enables us to discover things which cannot be perceived by simply examining the outside of this part; such as *exostoses*, which sometimes affect it, &c. By thus examining the inside of this canal, when by long practice we have acquired the habit of it, we may discover the length of its different diameters within a few lines; and especially that of the small diameter of the superior *strait*, as I have already explained. In the same manner we may measure the distance of the *coccyx* from the *sympkyses* of the *pubes*, by keeping the radial edge of the finger against the inferior edge of the latter, and its extremity against the point of the former, which we are to push back as much as possible.

136. The depth of the *pelvis* behind may be measured by the length of the *sacrum;* at the sides, by taking half the height of the *ossa ilia* from the anterior superior *spine* to the *tuberosity* of the *ischium;* and before, by the extent of the *symphysis* of the *pubes.*

137. It is not more difficult to find the elevation or height of the arch of the *pubes*, by deducting the length of the *symphyses* from the depth of the sides of the *pelvis.* For example, if the former is eighteen lines, and the lateral depth of the *pelvis* is three inches and an half, the height of the arch will be two inches. Lastly, the breadth of this arch may be known by means of the finger applied transversely in the *vagina;* or by feeling externally at the sides, and along the *labia pudendi.* The distance between the *tuberosities* of the *ischia* also demonstrates this breadth very well.

Explanation of the sixth Plate.

This plate represents a vertical section of the *pelvis*, reduced to about half its natural dimensions, with the *pelvi-meter* of M. *Contouli*, and my *calipers*.

Fig. I. A, A, A, A, The four last *lumbar vertebræ*.

B, B, B, The *os sacrum*.

C, C, The *coccyx*.

d, d, Surface resulting from the section of the *symphyses* of the *pubes*.

E, The left *iliac fossa*.

F, The left side of the superior *strait*.

G, The *sacro-ischiatic* ligament.

H, The *tuberosity* of the *ischium*.

i, i, The entrance of the *vagina*.

K, One of the *labia pudendi*.

L, The *anus*.

M, The *mons veneris*.

N, The left *natis*.

Fig. II. The *calipers* which I use for measuring the *antero-posterior* diameter of the superior *strait*.

a, a, The branches of the *calipers*.

B, The hinge which unites the two branches.

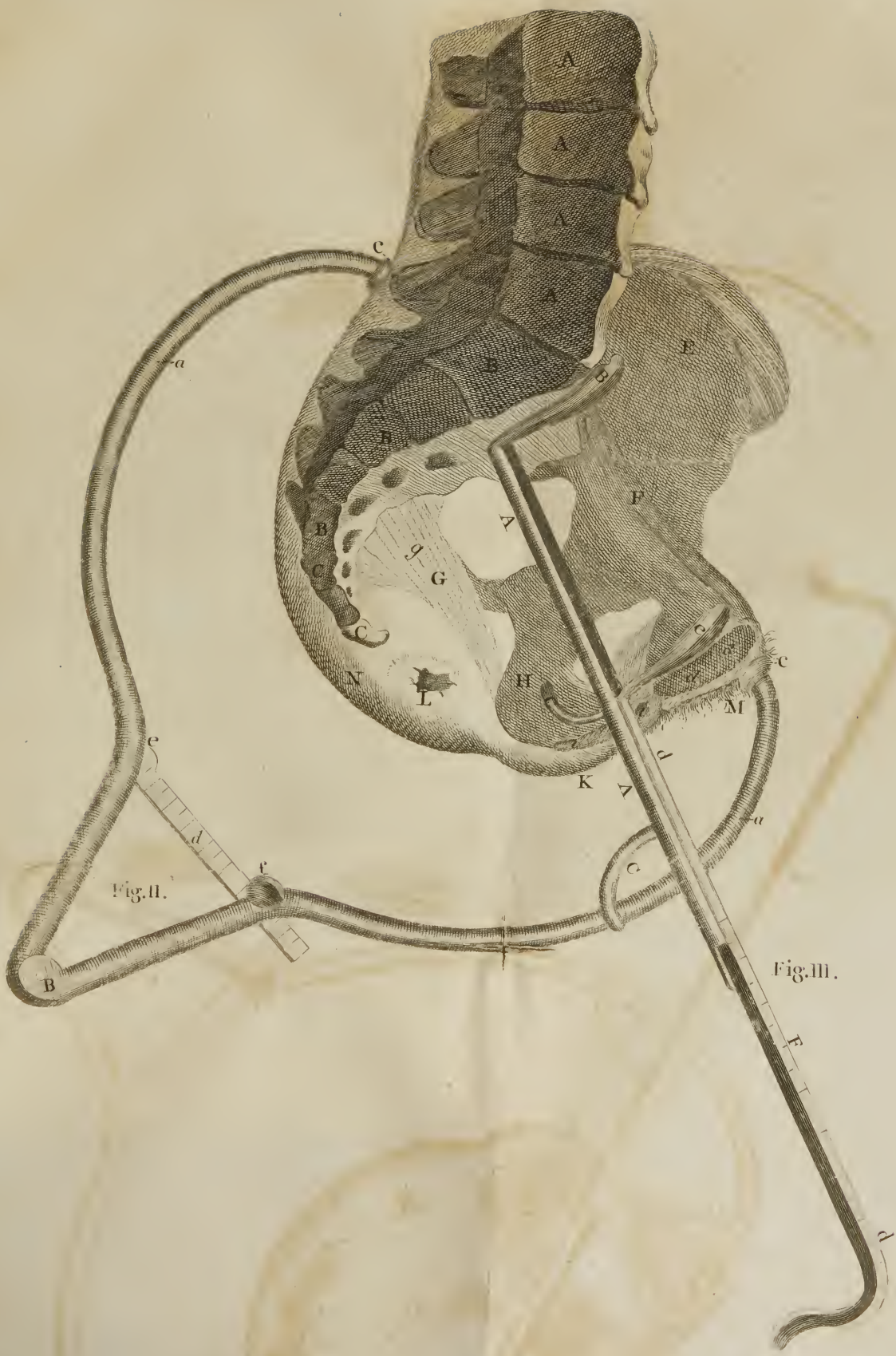
c, c, Lenticular buttons which terminate the branches.

d, A graduated scale, nine inches long, intended to demonstrate the thickness of the body comprised between the branches.*

* This scale is contained in a deep groove cut lengthwise in the branch of the *calipers*, from the letter *e* to the hinge

Fig. I.

Plate VI.



e, The place where the scale is united by a kind of hinge.

f, A little screw, with a flat head, intended to fix the scale, while we calculate the thickness of the body comprised between the branches.

Fig. III. The *pelvi-meter* of M. *Contouli* developed in the *pelvis*.

A, A, The first branch, whose square, B, is applied to the projection of the *sacrum*.

C, C, A kind of hooks, intended to keep the first branch in its place while we introduce and develop the second.

This branch has a dove-tailed groove, in which the body of the second branch is lodged and moved.

d, d, The second branch of the instrument, whose square, e, is placed against the *symphyses* of the *pubes*.

F, A scale, four inches long, graduated on the branch d, d, and intended to show the degree of opening from the *pubes* to the *sacrum*.

Note, We have not confined ourselves scrupulously to the geometrical proportions of these two instruments; but we have reduced them here, as well as the *pelvis*, to about half their natural size.

B; and passes through a mortise made in the other branch, under the letter *f*.

Of the Parts of the Woman concerned in Generation and Delivery.

138. These may be divided into external and internal: the external are the *mons veneris*, the *labia pudendi*, the *sinus* called the *vulva*, the *nymphæ*, the *clitoris*, the *urethra*, the orifice of the *vagina*, the *hymen* in virgins, the *caruncule myrtiformes*, the *fourchette*, and the *fossa navicularis*. The internal parts are, the *uterus*, and its dependencies; that is to say, the *ligaments*, the *fallopian tubes*, the *ovaria*, and the *vagina*.

139. The *mons veneris* is that region covered with hair, situated at the bottom of the *hypogastrium*, and before the *pelvis*. The teguments below this part divide into two columns, which run in parallel lines towards the *anus*, and form the *labia pudendi*.

140. These are firmer and thicker in virgins and young women, than in others. Their internal face is always moist, of a bright red in the former; and, on the contrary, pale in those who have had children. Their external face is covered with hair at the age of puberty. The *labia pudendi*, in their natural state, have only a very narrow chink between them; but, when we separate them, we discover a *sinus* called the *vulva* in which are found the other external parts of generation.

141. The most obvious of these are the *nymphæ;* which are two bodies narrow and close at their origin, but separate as they recede backwards, so as nearly to represent a pair of compasses moderately extended. They serve to direct the urine downwards, and also serve to augment the entrance of the *vagina* when the head of the child is about to pass it.

142. Above the *nymphæ* a semilunar fold is per-

ceived which hoods the *clitoris;* this part is extremely sensible, and supposed to be the seat of venereal pleasure—the *clitoris* is attached to the anterior part of the *symphysis pubes*, by a ligament which is called *suspensor;* it has vessels of every kind.

143. On separating the *nymphæ* we discover the urinary passage; this is the extremity of the *urethra*, it is shorter in women than in men, although its structure differs very little from it. It passes under the *symphysis* of the *pubes*, and rises obliquely backward to the bladder. Its direction is altered by pregnancy, so that at the latter periods, it rises almost perpendicular behind the *symphysis*, and sometimes even a little curved over it.

144. Below the orifice of the *urethra* is found the entrance of the *vagina*. This opening is bordered by the *carunculæ myrtiformes* in women, and in virgins by the *hymen*. A little below the *hymen* we find a semilunar fold called the *fourchette*, this for the most part is destroyed by labour. Between these two we remark the *fossa navicularis*.

145. The *perinæum* is the space between the *vulva* and *anus*. It is about two fingers in breadth, in the natural state, but capable of great extension in the time of labour. A kind of seam called the *raphe* runs through its whole extent.

Of the Uterus.

146. The *uterus* is the organ in which the important work of generation is almost always performed. This fleshy, vascular, and membranous *viscus*,

is situated in the *pelvis*, between the *rectum* and *bladder*, with both of which it has connexions.

147. Its figure is very like a flatted pear, of the length of two inches and a half, or thereabouts; its breadth is from eighteen to twenty-four lines, and its thickness ten or twelve only.

148. It is distinguished into *fundus*, body, and neck. The *fundus* comprehends all that part above the insertion of the *fallopian tubes;* the body is immediately below it, and extends to the narrowest part of this organ, where the neck commences; this latter terminates in the *vagina*, forming a kind of large nipple, which has some resemblance to the mouth of a tench. The *uterus*, considered externally, presents two faces, both a little convex: three edges, one of which forms the *fundus*, and the other two the sides: lastly, three angles; that is to say, two superior and lateral, where the *fallopian tubes* enter; and one inferior, which projects into the *vagina*, and is called the *os tincæ*. Excepting this last part, the *uterus* is covered by the *peritonæum* through its whole extent; and this membrane adheres to it so closely, that it seems to enter its very structure; though it only envelops it in its duplicature, as we observe with respect to the other *viscera*.

149. When the uterus is unimpregnated, we cannot absolutely determine what is the order and arrangement of its fibres, they are so inextricably interwoven. It would be as difficult also to know their nature, if their common properties with muscles had not often manifested it in time of labour. These fibres are paler and much closer in the neck of the *uterus* than in its other parts, where they appear softer, redder, and of a looser texture.

150. On opening the *uterus* longitudinally, we discover its cavity; and may estimate the thickness

of its *parietes*, which in general is but three or four lines: its substance appears spongy, and as it were *diploical*, in the *fundus*, and through the whole extent of its body; but denser and closer in the neck, properly so called: which doubtless arises from the distribution of the vessels which pervade it, and which the knife divides transversely.

151. Although the cavity of the body and that of the neck of the *uterus* are but one, it is the custom to distinguish them from each other, and to describe them separately. That of the body is of a triangular figure, and would scarcely contain a bean: it terminates above and at the sides by two very small orifices, which form the beginning of the *fallopian tubes;* and below by another, larger, which is called the internal orifice of the *uterus*.

152. This cavity is lined by a very thin membrane, which adheres as strongly to the substance of the *uterus*, as the *peritonæum* which covers it exteriorly.

153. This membrane is so porous, that it appears, as it were, reticular. The most considerable of these openings lead to winding cavities, called *uterine sinuses;* and others to *folliculi* or *glands*, which furnish that mucous and glairy humour with which the internal surface of the *uterus* is continually lined; and the least of all are only the extremities of absorbing or exhaling vessels. These latter are equally distributed throughout; but the first are more numerous at the *fundus*, and the second towards the neck.

154. The cavity of the neck of the *uterus* is a kind of canal about an inch long, and a little larger in the middle than towards its extremities. It is lined by the same membrane as the cavity of the body of the *uterus*. The neck of the *uterus* opens

into the *vagina* by a little transverse chink, called the external orifice of the *uterus;* and it is this chink which gives the projecting portion of the neck of the *uterus* the figure of a tench's mouth.

155. The *os tincæ* seems about four or five lines long before, and a little more, backward; its thickness is about eight or ten transversely, and from six to eight from the anterior to the posterior part, in which direction it is a little flatted. The chink is not exactly at its extremity, but a little backward; which makes its anterior lip appear thicker than the other.

156. Pregnancy and delivery commonly so efface these characters, that the *os tincæ* is entirely different in women who have had children. In them, it is generally thicker and rounder; and the edge of its orifice, then almost always open, is found more or less unequal, and sometimes even, as it were festooned.

157. The arteries which are distributed to the *uterus*, come from the *spermatic* and *hypogastric*. It is at the sides that they penetrate its substance, from whence their branches go backward and forward, making an infinite number of convolutions round themselves, forming a great number of *areolæ* and *anastomosing* with each other; that is to say, the spermatics with those which come from the hypogastric, and those of the right side with those of the left. Some of them terminate in the veins which accompany them; and others in a particular kind of vessels, known by the name of *sinuses*. The *sinuses* form, as it were, so many reservoirs, where the blood deposited by the arteries is re-absorbed by the veins, which return it into the circulating mass.

158. We cannot doubt of the existence of *lymphatic* vessels in the *uterus;* but their source and

their course are not so well known as those of the former. They are so numerous and so large in the latter periods of pregnancy, that we might be almost tempted to believe, says Mr. *Cruikshank*, that the *uterus* is nothing but a composition of absorbent vessels. This learned English anatomist divides them into two planes, one of which accompanies the *hypogastric* vessels, and the other the *spermatic*.—See *Cruikshank*, Anatomy of the Absorbent Vessels of the Human Body.

159. The nerves of the *uterus* are derived from the *venal plexus*, and the *hypogastric*, from the great *intercostal*, and the *sacral* nerves. Considering these numerous sources, and the communication of these nerves, we ought not to be surprised at the extraordinary sympathy of this organ with all parts of the body, and at the variety of symptoms produced by the diseases which affect it.

Of the Parts dependent on the Uterus.

160. The parts dependent on the *uterus*, are its *ligaments*, the *fallopian tubes*, the *ovaria*, and the *vagina*.

161. There are four principal ligaments, two broad, and two round; the two former, are folds of the *peritonæum* which seem to divide the *pelvis* transversely, and contain the *uterus* between them, they unite at the sides of this organ, and form as it were two wings—at their superior edge the *fallopian tubes* are enveloped, and at their inferior the *ovaria*—their use is to fix the *uterus* in the centre of the *pelvis*.

162. Through the cellular membrane which con-

nects these two folds of the *peritonæum*, the different blood vessels, and *lymphatics* run.

163. We there also remark two cords, one on each side, called the round *ligaments*, which descend from the superior angles of the *uterus*, before and a little below the beginning of the *tubes*. These *ligaments* bend towards the *pubes*, and pass out through the rings in the oblique muscles: they divide into many branches; and, forming a kind of *crow-foot*, lose themselves in the cellular membrane, and in the *tegument*s round about the groins.

164. Besides the four ligaments just mentioned, there are two others; one called the anterior round ligament, and the other the posterior round ligament—they are also folds or duplications of the *peritonæum;* their use the same as the broad ligaments.

165. The *fallopian tubes* are two conduits which take a winding course; they are about three or four inches in length, and their name sufficiently describes their figure. They are so narrow at the end next the *uterus*, that their orifices will scarcely admit a very small bodkin; but they enlarge insensibly as far as their middle, where they narrow a little, and then dilate again: they terminate in a kind of expansion, which is bordered by a fleshy fringe. This extremity is loose and floating in the cavity of the *pelvis*.

166. The structure of the *tubes* appears to be absolutely the same as that of the *uterus;* like that they are enveloped by the *peritonæum;* we find in them several orders of fibres; and they are capable of extension and contraction. One of the fleshy fringes which border the expansion of the *tube*, is attached to the *ovarium;* the others seem destined to dilate it, and apply it strictly to that body, in or-

der to receive from it what the woman furnishes for generation.

167. The *ovaria* are two whitish bodies, nearly of the size and figure of a large bean. They are placed loosely in the posterior pinions of the broad ligaments; and are attached by a kind of ligamentous cord to the superior and lateral parts of the *uterus*, behind the origin of the *tubes*. These bodies are larger in the prime of life than in advanced age, when they in some measure wither and dry up. They are a little plump during the time the woman is fruitful; and, according to some authors, are marked with as many *cicatrices* as she has had children.

168. We know not perfectly either the structure or use of the *ovaria:* we only know that they are necessary for generation; and that to deprive animals of them, is sufficient to take away from them the faculty of propagation.

169. The *tubes*, the *ovaria*, and the *ligaments* of the *uterus*, are supplied by the *spermatic* vessels, which form by their division, in women as in men, a kind of body like a vine, from whence the different branches go to their destination.

170. The *vagina* is a membranous canal, naturally narrow in virgins, and always so short, that we may easily touch the neck of the *uterus* with the extremity of the finger; but its dimensions vary according to circumstances. It may be stretched to the length of more than half a foot, and widened so as to contain the head of a child: but it soon returns to its natural state when the causes of its alteration cease to act; which proves that its texure is very elastic.

171. The anterior part of the *vagina* is much shorter than the posterior, because that canal is a

little curved towards the *pubes*, and its two extremities are, as it were, cut with a slope. One of them embraces the neck of the *uterus*, about five or six lines above the external orifice; from whence the internal membrane of that canal seems to be reflected over the *os tincæ*, and continued into the *uterus* itself. The other extremity of the *vagina* forms the entrance of it; it is surrounded by a very considerable vascular *plexus;* and embraced by two fleshy bands, which mount from the *sphincter ani* to the *clitoris*, called *constrictor* muscles. The plethora and swelling of the former, joined to the contraction of these latter, narrow the entrance of the *vagina* more or less, and often in a very remarkable manner.

172. The structure of the *vagina* is not yet very well known. Some give it a fleshy coat, composed of two orders of fibres; that is to say, longitudinal and circular. Others, without more reason, allow it only two membranes; of which the internal, much more extensive and of a closer texture than the other, forms an infinite number of folds or wrinkles, which singularly diminish the capacity of that canal: while the external is merely cellular. It is those folds in the former, and which nature has placed there as in reserve for the time of labour, which permit the *vagina* to lengthen and enlarge as occasion requires.

173. Between the two membranes of the *vagina*, and chiefly towards its inferior extremity, run considerable blood-vessels; and there we find a great number of glands, which secrete the mucous liquor which always lines the inside of that canal.

174. The *vagina* is not insulated in the midst of the *pelvis:* it has very close connexions, by means of the cellular membrane, with the canal of the *ure-*

thra, with the lower part of the *fundus* of the *bladder*, and with the *rectum*.

175. Its vessels arise from the *pudica communia*, which likewise sends some to the external parts of generation; and its nerves come from most of the sources which supply the *uterus*.—See § 159.

176. The augmentation of the *uterus* is scarcely sensible from one month to another at the beginning of pregnancy: but it becomes so large in the sequel, that it is difficult to conceive how it can be effected. Until the third month, the *uterus* in most women continues small enough to be contained within the cavity of the *pelvis;* and it is not generally till the fourth that its *fundus* rises sufficiently above the superior *strait*, to be manifestly felt by applying the hand to the *hypogastric* region. In the fifth month it mounts to within two fingers' breadth of the *umbilicus*, and is as much above it at the end of the sixth. In the seventh, it enters the *epigastric* region, and occupies a great part of it in the eighth; but is often found below it at the end of the ninth.

177. Although the *uterus* increases in every direction during pregnancy, in proportion to the augmentation of the produce of conception; yet all its diameters do not increase in the same proportion in every period, whether in respect to themselves, or to the *fœtus*. The longitudinal axis of this *viscus* increases much more from the third to the sixth month, than from that to the ninth: while the other dimensions augment much less in the first periods than in the latter; when the cavity evidently grows rounder in all parts, without however entirely losing that oval figure which appears natural to it. This cavity, relatively to the *fœtus*, is very large in the two first months, and very small in the latter.

Of the Changes which Pregnancy produces in the Volume, Figure, and Structure of the Uterus.

178. The fibres of the *fundus* of the *uterus* yield more readily than those of the neck until the sixth month of pregnancy, and hence afford all the necessary room to the *ovum* until this period; then the fibres of the neck begin to develop, and contribute with those of the *fundus*, to the necessary enlargement for the *fœtus*, and its appurtenances. From this time all the fibres unfold equally, and continue to do so until towards the latter period of pregnancy; the dilatation now is made almost exclusively at the expense of the fibres of the neck, because those of the *fundus* begin to make resistance, and the equilibrium in the reaction of these parts no longer exists.

179. As soon as this equilibrium is destroyed, the fibres of the body and *fundus* begin to make efforts to expel the contents of the *uterus*. This is manifest to the touch, as the membranes when felt through the *os tincæ* are found alternately relaxed and tense.

180. The fibres of the neck at this time sustain, not only this action of the body and *fundus*, but also the weight and influence of the contents of the *uterus*, which obliges them to unfold so rapidly, that the neck is effaced completely in two months. If the *uterus* enlarges still more after this period, it is entirely at the expense of the fibres of the neck, which so arrange themselves as not to be thicker sometimes at the orifice, than two or three folds of common paper.

181. It is by this mechanism that the dilatation of the orifice of the *uterus* is effected, and labour pains manifest themselves, and it is from these changes almost invariably taking place, and in the order mentioned, that nine months is the usual period of gestation, as it requires that period for the most part for these circumstances to obtain.

182. Whenever the fibres of the *fundus*, and body of the *uterus*, too strongly resist development in the first periods of gestation, delivery takes place before the proper time, and quite as naturally as at the end of the ninth month; because those of the neck are forced to unfold prematurely, and cannot support the reaction of the others beyond a certain time. On the contrary, labour happens later in those women where the neck of the *uterus* does not unfold at the time intended by nature; either because the fibres of the superior parts are more extensive and less irritable than usual, or because the neck is affected by a scirrhous hardness.

183. This double assertion is not, as some may imagine, merely the fruit of speculation, intended to square with an established theory; but a truth which experience and observation have many times demonstrated. I have met with a great many of these cases where premature delivery has been entirely owing to the feeble organization, either natural or accidental, of the neck of the *uterus*.

184. When we compare the *uterus* at the approach of labour with what it was before pregnancy, we see that its extension is less the effect of a simple development, than a kind of generation, or rather of increase, which does not always take place without injuring the original parts. According to M. *Levret*, the solid mass of the *uterus* in its natural state, or in a state of vacuity, is about

four cubic inches and a half, and at the latter end of gestation fifty-one inches; so that, says he, the proportion of the smallest *uterus* to the largest is nearly as 9 to 102, or as 1 to 11½. *

185. The *uterus* does not, in fact, extend after the manner of the bladder: if its *parietes* do not preserve all their natural thickness while it acquires a larger capacity, at least they lose so little of it, that many authors have thought it remains the same in all periods. Indeed, while those have advanced that the *uterus* in developing loses nothing of its thickness, others have maintained that that thickness diminishes insensibly from the first period of gestation to that of labour; and some, of an absolutely contrary opinion, assure us that, far from diminishing, it augments in the same proportions as the uterine cavity becomes larger.

186. Such a variety of sentiments on a matter of fact, may have arisen from the part of the *uterus* that has been examined, and from the time at which they have endeavoured to estimate its thickness. It is moreover certain that the *parietes* of the *uterus* do not present the same thickness in all women at the latter end of gestation, nor in the same woman at the end of every pregnancy; for, independently of the differences which may be looked on as individual, there are accidental ones, which depend on the smaller or greater degree of dilatation, in each pregnancy, and on the quantity of fluid determined to the *uterus*, to nourish and develop its substance.

187. To judge of the thickness of the *parietes* of the *uterus*, at the latter end of pregnancy, we ought to examine that *viscus* in the state of its greatest dilatation, that is to say, before the waters of the *amnion* are evacuated; for that thickness augments

* L'Art des Accouchemens, troisieme edit. 390.

in proportion as it contracts, and its cavity diminishes, immediately after delivery—we ought to examine it in all parts, because there are some where it is constantly thicker, and others where it is always thinner, than its natural state. The place where the *placenta* is attached, is always that where the thickness of the *parietes* of the *uterus* is the most considerable; and the vicinity of the orifice that where it is least. If it does not augment in the former during pregnancy, at least we may be sure it remains such as it was in every part before impregnation; it is the only part where it seems to preserve the same state. It diminishes in the rest, and very manifestly in the neck, so that the edge of the orifice is often no thicker than two or three folds of writing paper.

188. If it is demonstrated that the *parietes* of the *uterus* preserve the thickness which they have at the end of pregnancy only by the influx of fluids; that their vessels dilate; in one word, that they become more spongy and humid; why not admit that the place where the *placenta* is attached developes itself as much as the others, if not more?

189. Those who are acquainted with the texture of the *uterus*, and the extraordinary resistance which in its natural state it opposes to any dilating force, cannot, without astonishment, see it yield in pregnancy, and permit the *fœtus* to be freely evolved in it: the more we consider it, the more wonderful the operations of nature will appear in this part of her work.

190. The fibres of the *uterus* not only unfold and lengthen during pregnancy, but they also become softer, more spongy, and redder; so that at last we recognize in them all the appearances of muscular fibres: like them too they are extremely irritable and capable of contraction.

191. The vessels of the *uterus* are not exempted from the effects of pregnancy. Bound to the fibres which they supply, and extended by them in their development, their numerous windings are effaced; and being less pressed by the fibres which surround them, some of them are dilated to a surprising degree.

192. If that dilatation is not observed in all the regions of the *uterus* where there are sensible vessels, at least we observe it constantly in the parts occupied by the *placenta:* there all accoucheurs know that many of the *sinuses* mentioned in par. 158 become large enough to receive the end of the little finger, and the others a moderate-sized quill. It is not only the sanguine vessels which are developed to that degree during pregnancy: the lymphatic vessels are much more so, in proportion to their primitive diameters; since, according to Mr. *Cruikshank*, they become as large as a goose-quill; and besides appear so numerous, that the *uterus* seems to be nothing but a mass of those vessels.

193. In proportion as the *uterus* is developed, as its texture becomes softer and more spongy, the arteries being straighter and less pressed, give less resistance to the course of the blood; the motion of that fluid becomes freer in them; they then receive a greater quantity in a given time; they transmit more into the *sinuses* or reservoirs which communicate with the *placenta*, and deposit there the portion of blood destined to vivify the *fœtus* and all its dependencies.

194. If these first phenomena are so many natural effects of the development of the *uterus* during pregnancy, its contraction at the moment of delivery produces others not less interesting, since they furnish us with useful reflections in practice.

195. In proportion as the cavity of this *viscus* diminishes, the vessels fold and become convoluted as they were before impregnation; they suffer a compression not only so much the stronger, as the action of the *uterus* on the contained body is more powerful, and as that body gives a greater resistance; but also as it approaches nearer to its natural state.

196. During this time the blood flows with more difficulty through the arteries, and passes more slowly into the *sinuses;* the *sinuses* receive a smaller quantity of it in a given time than before, and transmit less into the parts indicated into par. 193.

197. The blood passes with so much difficulty in the arteries of the *uterus* when the labour becomes strong and lasting after the evacuation of the waters of the *amnion*, that all communication seems to be intercepted between that kind of vessels and the *sinuses* in which they partly terminate; and between the *sinuses* themselves and those of the *placenta:* so that the child can be no longer vivified by the blood of the mother, nor is there any considerable flooding to be feared if the *placenta* should be detached; and if any existed before, it will from that time be suspended. The closing and contraction of the *uterus* after the exit of the child, and still more after delivering the afterbirth, produce the same phenomena.

198. It is on these observations that is founded the precept which will immortalize the celebrated *Puzos* and the rational practice which he wisely substituted to the blind and murderous *routine* followed by most accoucheurs before his time, in cases of violent flooding.* They serve equally for the

* Voyez l'Ouvrage de Puzos, Memoire sur les Pertes de Sang.

base of an enlightened theory on the origin and natural cessation of the sanguine and serous *lochia*, and for the explication of several other effects which I shall speak of in the sequel.

Of the Action of the Uterus.

199. The *uterus*, very sensible and very irritable, in common with all muscles, enjoys two modes of action—a tonic action, or elasticity, which is equal and constant; and a spasmodic contraction, which is sudden and momentary. By the former, when it is distended it constantly endeavours to restore itself to its original state; but it is by the latter that it acquires the force necessary to overcome the obstacles to that restoration, and to deliver itself of the bodies which encumber and incommode it.

200. The tonic action of the *uterus*, or its elasticity, subsists after death, and seems to continue as long as the heat of the subject. The expulsion of the *fœtus* and its dependencies, after the death of the woman, seems to confirm this truth;* and it is likewise proved by the contraction of the *uterus*, which takes place as quickly and strongly as after the most common labour, when we extract its con-

* Many authors assure us, that some women have been spontaneously delivered after their death; I shall dispense with quoting them. M. *Levret* adds to their testimony, by saying that he is convinced of it from his own experience; but I do not make myself responsible for any of these facts.‡

‡ Harvey mentions the same fact, but with a view to prove the agency of the child in its own delivery. W. P. D.

tents at the instant life ceases.* If we have a right to conclude, from these observations, that the tonic action of the *uterus* continues some time after the cessation of life, experience equally proves that it may be so weak after delivery as to appear in some measure destroyed. As the *parietes* of the *uterus* then remain soft, and without apparent action, it is usual to express that state by the name of *atony*. I must observe, with the surgeon of *Dijon*, whom I have just quoted, that the atony in question is not an absolute loss of tone in the *uterus;* but only a diminution of its action, and of its irritability and sensibility; a state of weariness, of *exhaustment;* or, in one word, of *syncope*, to make use of the expression of the aforesaid surgeon.

201. In this state the irritability and sensibility of the *uterus* are sometimes so weakened, that it will without difficulty bear the presence of the hand; and even stimulating liquors injected into it cannot force it to contract. This case, often melancholy for the woman, is at the same time one of the most deplorable for the operator, whom unreasonable people consider as accountable for all events; for, notwithstanding his utmost care and activity, he

* M. *Le Roux*, surgeon, of *Dijon*, perceived, in delivering a woman who had been dead about a quarter of an hour, that the *uterus* contracted in proportion as he disengaged the child from it; and was as firm and solid as if the woman had been living. When he proceeded to extract the *afterbirth*, the neck of that *viscus*, he says, obstructed the introduction of the hand so much, as to give him some doubts of the reality of the woman's death. (Voyez Traité des Pertes, observ. xiii. p. 25.)—In opening the body of the woman, whom I had delivered in the same manner immediately after her death, I found the *uterus* strictly contracted on the *placenta*, which I had not thought necessary to extract after the child.

has almost always the mortification to see the woman sink under the hæmorrhage.

202. The atony of the *uterus*, considered in this sense, may affect all parts of that *viscus*, or only one. Sometimes it takes place in the *fundus* and body only, while the neck enjoys its full tone: at other times the neck alone is attacked by it, while the other parts contract and close as usual. It may be in a greater or less degree; and manifest itself at the instant of delivery, or some hours, or even days, afterwards; it may go off and reappear a number of times, like a *syncope*, properly so called: so that it is not sufficient that the *uterus* be contracted in the first moments, as almost always happens after delivery, for the woman to be secure against an hæmorrhage, and for the accoucheur to dismiss all fear.

203. The remote cause of atony may be, a bad constitution in the woman; an hæmorrhage from the *uterus* itself, which sometimes precedes or accompanies labour; an extreme dilatation, when the *uterus* contains much water, or several children. It may be the effect of strong and long continued labour pains, because the forces of the *uterus* may be exhausted, as well as those of other organs; and a sinking always succeeds every species of immoderate action. Lastly, it is never more to be feared than after those deliveries which the vulgar regard as the most fortunate, because they are the quickest and least painful. In this sort of cases, the *uterus* being evacuated suddenly, and without any efforts, the child is, as it were, washed out by the current of the waters; and the *uterus* falls into a kind of torpor and relaxation, which for a time suspend its contractile faculties.

204. This state of uterine *syncope* is more or less

troublesome and dangerous, as it continues a longer or shorter time; as it affects all the parts of the *uterus*, or only one; and as the *placenta* preserves more or less of its connexions with that *viscus*. The atony whose remote cause is an hæmorrhage which has preceded labour, is more dangerous than that which arises from the quick and too sudden evacuation of the contents of the *uterus*. In this latter case there is nothing alarming while the *placenta* is not detached in any part; but it may have consequences equally dangerous, if that body should separate before the forces of the *uterus* be sufficiently restored. An atony of the neck only is not so alarming as that which affects the *fundus* and body of the *uterus;* because the *placenta* is most commonly attached to the latter, and more open orifices are found there than in the former, &c.

205. An hæmorrhage is the only accident which can essentially arise from an atony of the *uterus;* but it cannot take place unless the *placenta* be detached, either totally or in part. The quantity of blood which a woman loses in a given time, is in proportion to the degree of atony, to the quantity of the *placenta* separated from the *uterus*, and to the *momentum* of the blood, often augmented by the labour pains which have preceded it.* The hæmorrhage is not always apparent: the blood sometimes is retained in the *uterus;* and may so far dilate

* A woman lost before my eyes, and in presence of at least thirty-five of my pupils, more than four pounds of blood in the short space of three or four minutes, notwithstanding the promptitude with which she was assisted: the *coagulum* collected from the bed, and put into the scale, weighed more than three pounds. The woman was able to be carried home; and was so, contrary to my wish, some hours afterwards, without the least inconvenience.

it, as to give it nearly the capacity it had before the exit of the child.*

206. A concealed hæmorrhage is more usual when only the body and *fundus* of the *uterus* are affected by an atony, than when it takes place in all parts of it. The closing of the neck, in the former case, is sufficient to retain the blood in the cavity; whereas, in the latter, a congestion cannot be formed, unless some foreign body mechanically stops up the *vagina*.

The state of weakness and relaxation which we call atony, disposes the *uterus* to be inverted, if we attempt to extract the *placenta*, when it still adheres, before the *uterus* be contracted, and reduced to a kind of globe, a little firm to the touch; as also if the woman exerts strong efforts to expel it, while that *viscus* is soft and inactive.

The indication presented by an atony of the *uterus* consists in rousing the faculties which are, as it were, asleep—in augmenting the sensibility and irritability of that *viscus:* this is done by frictions on the hypogastric region; by applying hot cloths to it, and sometimes cold liquors, either *aqueous* or spirituous; and by injecting them into the cavity of the *uterus*. A flooding which arises from this state of atony requires no other treatment; and cannot be stopped but by the restoration of the faculties in question.

207. The spasmodic contraction of the *uterus* is a much more powerful action than its elasticity: it is produced by an irritating cause unknown to us; and, unlike that of most of the muscles, is not sub-

* In the woman whom I mentioned in one of the former observations, though at the seventh day of her lying-in, the extravasation of blood in the *uterus* was so considerable, that its *fundus* rose above the *umbilicus*.

jected to the will: no woman can augment its force, or diminish it; accelerate its return, or retard it; though strong passions of the mind may call it into action, or stop its progress.

208. All parts of the *uterus* contract at the same time, no one remaining at rest while the others act: but this contraction is not equally strong in every part; for if it were, delivery could not advance. If it is stronger, in what is commonly called the *fundus* than in its neck, it is because the fibres are not equally disposed, nor equally numerous in those two parts: each *fasciculus*, taken separately, seems to act with the same degree of force.

Of the Descent or Prolapsus of the Uterus, of its Retroversion, and Anteversion.

209. If the *uterus*, in a state of vacuity, descends by the smallest impulse from the abdominal *viscera*, it does it in a much more remarkable manner during the first months of gestation; as well because it presents a greater surface to those same viscera, which renders their impulsion stronger, as because its weight becomes specifically greater. It not only descends farther at every impulse it receives, to rise again afterwards; but in general we find it habitually lower in these first periods of gestation than it was before; and we observe that its *fundus* is almost always inclined backward, and its orifice turned forward.

210. The accidents which arise from this first species of *deplacement*, are in proportion to its extent, and the volume of the *uterus* relatively to the capacity of the *pelvis*. A sensation of heaviness at

the fundament; painful draggings about the groins, the *umbilicus*, and the loins, are the only ones which accompany the first degree of precipitation of the *uterus:* a sensation of weakness, lowness, and faintness supervenes, if the *uterus* descends farther; and the woman insensibly falls into a *marasmus*, if some remedy be not applied. I have seen several, in whom the return of health and flesh has been produced merely by the application of a *pessary.*

211. If the effects of a precipitation of the *uterus* are limited to a few slight inconveniences in the first months of gestation, it is not always so in the sequel. The *uterus* increasing more and more, and remaining so low, may compress the neck of the *bladder*, the *urethra*, and the *rectum*, in the same manner as a wedge strongly pressed into the middle of the *pelvis;* which must occasion a retention of urine, a constipation, and other accidents which will arise from those, as well as from the pressure which the *uterus* itself must exert on the other circumambient parts.

212. It is not only in those cases where the *uterus* is thus developed in the midst of the *pelvis*, that it occasions a retention of urine; the same accident may happen if the *uterus*, less voluminous, descends so far as to engage itself very forward in the external parts, and show itself without. This case, more easy to distinguish than the former, and in appearance more severe, since the descent of the *uterus* is greater, is not however so troublesome with respect to the retention of urine. When that symptom proceeds from such a degree of precipitation of the *uterus*, it manifests itself all at once; and it is often the first effort of the woman to make water that forces it so low. In the other case, the retention of urine comes on slowly, and it is very rare that it

takes place before the fourth month of pregnancy. At first the woman only finds a little difficulty in making water; and greater obstacles succeed, by insensible degrees, till the retention becomes complete.

213. The course of the urine is quickly restored, in the former case, by pushing up the *uterus* in the *pelvis*, and supporting it so with the finger. Even that assistance in many circumstances would not be necessary, if the woman would lie on her back, and keep the breech raised, whenever she feels an inclination to make water.

214. We cannot so easily prevent or remedy it in the latter case. For it to cease, the body of the *uterus* must rise towards the middle of the belly, and be so far developed that it cannot descend again into the *pelvis;* which generally does not take place till after the fifth month of pregnancy, and sometimes later. In the mean time, we may favour the discharge of urine by removing the body of the *uterus* from the *urethra* and neck of the bladder, with a finger introduced pretty high behind, and a little on one side of, the *symphyses* of the *pubis;* or we may draw it off with the *catheter* as often as occasion requires.

215. The mobility which the *uterus* preserves in the midst of the *pelvis*, in the first periods of impregnation, notwithstanding the augmentation of its volume, and the inclination which it takes in sinking a little, expose it to another species of *deplacement*, less known and more rare than the *prolapsus;* but whose consequences have hitherto appeared more disagreeable. In this new species of *deplacement*, the *uterus* seems to be laid lengthwise, between the *pubes* and *sacrum;* but so that its *fundus* sometimes remains a little higher than its ori-

fice, and sometimes much lower, or appears on the same line which constitutes so many degrees necessary to be observed in practice.

216. The *retroversion* is that *deplacement* in which the *fundus* of the *uterus* is turned towards the *sacrum*, and the orifice towards the *pubes;* and the *anteversion*, that in which the *fundus* is carried behind the *pubes*, and the orifice before the *sacrum*. Both one and the other may be more or less complete; but yet it seems, from the structure and connexions of the parts, as well as from observation, that the *anteversion* cannot become so considerable as the *retroversion*: it is besides more rare and less troublesome.

217. The *uterus* may be inverted in either of these ways, while unimpregnated, and in the first three or four months of pregnancy. After the fourth month, its volume is generally so great that it cannot suffer such a *deplacement;* because its height at that time, in most women, exceeds the breadth of the *pelvis*, taken from *pubis* to *sacrum*. One of the observations of *Smellie* seems nevertheless to prove, that this inversion in some cases may take place later, if he really found it in the woman who is the subject of it; since she was advanced in her pregnancy five months.*

218. This inversion may take place slowly or suddenly; and the determining causes are then different. In the former case, we may observe its progress from day to day, or from week to week, and it arrives insensibly at its highest degree; in the latter it becomes complete in less than an hour, and often in an instant.

219. When it takes place slowly, it seems to depend on the slight but continued pressure of the

* Smellie, trad. Franç.

floating abdominal *viscera* on the *fundus* of the *uterus;* either on its anterior or posterior part, according to the species of obliquity it has taken; so that this pressure sometimes occasions the *anteversion*, and sometimes the *retroversion*. It is by the same mechanism that both kinds take place suddenly; but that requires a stronger impulse, and that impulse may be given by the action of the abdominal muscles, or by external agents. The *uterus* has been sometimes inverted by straining to vomit, at stool, or even to make water; and this inversion has often been determined by a fall, a blow, or a strong compression of the belly. Some of the accidents produced by this *deplacement* soon add to its first causes, and render it more considerable, as I shall have occasion to remark in par. 225.

220. The accidents which proceed from the *retroversion* and *anteversion* of the *uterus*, depend much less on the degree or extent of the *deplacement* that *viscus* has undergone, than on its volume relatively to the capacity of the *pelvis*. When a healthy *uterus* and perfectly empty, is inverted in a *pelvis* of the natural size, whether its *fundus* be turned towards the *sacrum* or towards the *pubis*, the woman feels nothing but a troublesome weight on the fundament, painful draggings in the groins, the fore part of the thighs, and the loins; and a sort of uneasiness about the neck of the bladder, and *rectum*, which excites frequently an inclination to make water and to go to stool. These symptoms augment in proportion to the efforts the woman makes to overcome the obstacles which oppose the evacuation of the urine and *fæces*. If the former with a great deal of pain be established, it is sustained with difficulty, and appears often interrupted.

221. These accidents are manifested the moment

the *uterus* is inverted, when it is plethoric and tumefied, or when its volume is augmented by pregnancy; because it then acts with more force on the neighbouring parts, and is itself more incommoded. If the painful draggings which we have just mentioned are not more troublesome in the latter case than in the former, the weight on the fundament and on the neck of the bladder is greater; the uneasy sensations in the bladder and *rectum* are stronger; the difficulty of making water and going to stool is more considerable: and, according as the *uterus* is more or less voluminous relatively to the cavity of the *pelvis*, there is a complete or partial retention of urine, and an absolute constipation.

222. The accidents increase to this degree in a very short time; and are very quickly aggravated by new ones, when the *uterus* is completely inverted in the third or fourth month of pregnancy: because its length from the *fundus* to the orifice equals, and even surpasses, the distance from the *pubes* to the *sacrum;* which causes it to compress strongly the neck of the bladder, the *urethra*, and the *rectum*, from the moment of its inversion, and to be itself wedged in a very uneasy manner in the cavity of the *pelvis*. Though the progress of these accidents is rapid in this case, it may be very slow in that where the inversion of the *uterus* takes place gradually, and at a less advanced period of gestation.

223. Let us suppose it to take place before the second month, and to be complete. The accidents at first will be limited to those stated in par. 220, because the *uterus* is still small at that period; but as it is developed daily, notwithstanding its *deplacement*, and as it successively requires a greater space, it will at length more strongly compress the neck of the *bladder*, and the *rectum*, till they both become

so far effaced as no longer to permit the discharge of urine, or of the most liquid *fæces*. It may happen, in these circumstances, that the *catheter* cannot penetrate the bladder, and it may be equally impossible to administer clysters.

224. The *uterus*, already, as it were, wedged in the middle of the *pelvis*, when the accidents are increased to this pitch, is wedged much more strongly in it in the sequel, if we do not speedily effect the reduction. Continuing to be developed, because its contents continue to increase, and not being able to do it according to the order in which that development is made in the common state of pregnancy, it moulds itself to the form of the cavity of the *pelvis*, extending itself towards those parts where it finds the least resistance. The augmentation of its volume, in this latter period, does not only depend on the farther development of the produce of conception; it proceeds also from the tumefaction of its substance, which becomes full and inflamed. As the space which the *uterus* then occupies is greater than the superior *strait;* as it completely fills that space, and even finds itself compressed there; the reduction of it becomes extremely difficult, and may even be impossible; because the length of its diameters exceed those of the superior *strait*.*

* In one of the interesting observations of Dr. *Hunter*, inserted in the fourth and fifth volumes of the Medical Observations of London, we find that the *uterus* could not be reduced; that the woman, very weak when that physician saw her for the first time, died the next day; and, on opening the body, the *uterus* was found so wedged in the *pelvis*, on all sides, that it could not be disengaged from it, till the *symphysis* of the *pubes* was divided, and the bones considerably separated. The parts designed and engraved, in all the necessary views, are not the least valuable of those which formed the beautiful collection of Dr. *Hunter*.

225. The retention of urine, and constipation, which we have hitherto considered only as accidents proceeding from the *deplacement* of the *uterus*, soon become, as it were, additional causes which concur with the others so as to render it more considerable, and also to oppose its reduction; but it is only in that species called *retroversion*. The bladder cannot be greatly distended, and rise into the cavity of the abdomen, without bringing the neck of the *uterus* forward, and drawing it towards the upper part of the *pubis*, nor without acting on the body of the *viscus*, already depressed towards the *sacrum*, at least with a force equal to the weight of the urine it contains; and that weight may amount to more than ten or twelve pounds in some cases. The *fæces*, retained and accumulated in the upper part of the *rectum*, above that portion of the canal which is obliterated by the *fundus* of the *uterus*, act in the same manner, and press that part lower and lower. Add to that, the impulse which those *fæces* receive every moment from the intestinal action; and the efforts, often involuntary, which the woman exerts to make water, or go to stool.

226. These causes do not act so unfavourably in the case of *anteversion;* for they seem rather to concur in restoring the *uterus* to its natural position than in removing it farther from it; which may be easily perceived by the slightest attention to what is stated in the preceding paragraph.

227. Although the abovementioned accidents are so many symptoms of those *deplacements* of the *uterus* called *retroversion* and *anteversion*, they cannot however serve to establish the diagnostic of them; because there is not one of them which may not depend on another cause. It is only by the touch

that we can certainly discover these *deplacements*, and judge of the extent of each species: at a little distance from the entrance of the *vagina*, the finger meets with a pretty solid body, in form of a tumour, which fills the cavity of the *pelvis:* it is that of the *uterus*, which presents its anterior or posterior surface to the touch, according as it is found in a state of *anteversion* or *retroversion*, but always covered by the *vagina*. In the latter the *fundus* resting against the *sacrum*, the orifice answers to the *pubes;* in the former, the orifice is backward, and it is the *fundus* which depresses the neck of the bladder. In either case, if we pass the finger into the *anus*, to a convenient height, we find a tumour formed by the *fundus* or neck of the *uterus*, which depresses the intestine; and the *catheter* introduced into the bladder, when it can penetrate it, demonstrates the same thing.

228. The essential indication, in all these cases, is to replace the *uterus* in its natural situation, and to keep it in that state. Though we meet with few obstacles to this reduction when the *deplacement* is recent, and the volume of the *uterus* still small, they are very great, and sometimes insurmountable, when it has existed several days or weeks, and the voluminous *uterus* is wedged tight in the cavity of the *pelvis*.* Though the principal indication consists in replacing the *uterus*, as I have just stated, the accidents which arise from its inversion sometimes present more pressing indications, and require a treatment which becomes preparatory to the reduction, and without which in many cases it could not be obtained.

* See the case already quoted in the London Medical Observations.

229. We begin, in these cases, by evacuating the urine, if possible to do it, either by insinuating the finger along and on one side of the *symphysis* of the *pubes*, to remove the body of the *uterus* from the *urethra* and neck of the bladder, or by introducing a *catheter*. We must also evacuate the *fæces*, if clysters can penetrate and soften what are accumulated and hardened in the upper part of the *rectum*, and the Roman S of the *colon*. We must have recourse to bleeding, and repeat it as often as the inflammatory state of the parts require; we are to use fomentations and baths, and not to proceed to the reduction of the *uterus* till we have prepared it in that manner. Though it has appeared impossible, in some cases, before the use of these means, it has been easily performed afterwards, and even in a manner spontaneously.

230. The position of the woman which seems most advantageous, when we proceed to the reduction of the *uterus*, is that in which the abdominal *viscera* make the least pressure on it. Therefore it has been recommended to place the woman on her knees and elbows, so that the *pelvis* may be higher than the belly and breast. Though this position is good in some cases, it cannot be looked upon as essentially necessary in all. But it is very necessary that the woman should not make any pressure downwards while we are employed in replacing the *uterus*.*

* Whenever attempts are made to reduce the retroverted *uterus*, it is next to impossible for the woman to desist from forcing downwards; and thus by the pressure made upon the *uterus* by the *abdominal viscera*, it is prevented from ascending, and our efforts are thus counteracted. I have therefore made it a rule, in cases where symptoms required the reduction, to take off all resistance by bleeding my patient *ad deli-*

231. Reducing the *uterus*, is raising the *fundus* to its natural situation. To effect this, it is recommended by some to introduce the fingers into the *vagina*, and by others to introduce them into the *rectum*. It is impossible to ascertain the quantity of force necessary for the reduction; sometimes very little is required, and at others a great deal. The fear of producing abortion ought not to prevent our making an attempt, as this is not a necessary consequence, even where a great deal of force has been employed.

232. The reduction of the *uterus* is so important for the preservation of the woman, that Dr. *Hunter*, instructed by experience that it could not be accomplished, in some cases, without first diminishing its volume, has recommended to evacuate the waters of the *amnion*, which are always abundant in the first months of pregnancy, by a puncture through the *vagina*.† This puncture which is no

quium. When a state of faint is induced, I have her laid on her back on a bed, with her knees bent towards the *abdomen;* the parts having previously to the bleeding been well lubricated with hogslard, that immediate advantage may be taken of the relaxation; I then introduce my hand in a state of supination along the internal face of the *perinæum* towards the hollow of the *sacrum*, and thus make the extremities of my fingers carry along with them, the forced down *fundus*, until it is placed above the projection of the *sacrum*—I then introduce a common pessary, and leave my patient to rest; I recommend rest upon the bed for two or three days, draw off the urine for that period with the *catheter*, and have the bowels opened by mild injections.

It is to be remembered, that, the urine and *fæces* are discharged previously if possible, to any attempt at reduction—the success of this method has been invariable with me.

W. P. D.

† This practice I trust is never necessary, even in the most desperate cases, as I believe no case of this kind can occur where, the practice I have just ventured to recommend will not succeed. At least, Dr. Hunter's method should not be had recourse to, until the other has failed. W. P. D.

way dangerous in itself, has not yet been practised with that view; because the case for which *Hunter* recommended it, did not occur a second time in the course of his practice. I do not see that any thing better could be done in so deplorable a circumstance.*

233. The *uterus* being reduced, must be maintained in its natural situation. A proper position on the part of the woman, and an attention not to press downwards either to make water, or to go to stool, have sometimes sufficed for that purpose; but the application of a *pessary* seems indispensable in most cases.

234. The accidents which arise directly or indirectly from these *deplacements* of the *uterus* do not always cease immediately on the reductions being made; and often afterwards present new indications which must not be neglected: I shall only mention the retention of urine, as an example. It depended at first on the pressure exerted by the *uterus* on the neck of the bladder; but, after the reduction, it may be continued by the inflammation of that part, or by an atony of the bladder in consequence of its extreme dilatation. The surgeon must endeavour to discover the cause and treat it accordingly.

Of the Obliquity of the Uterus.

235. The authors who have spoken of the obliquity of the *uterus*, have established four general kinds of it:—1. An inclination forwards; 2. Back-

* See the Observations of Dr. *Hunter* in the London Medical Observations, vols. iv. and v.

wards; 3. To the right side; and, 4. To the left. One of the most celebrated has divided them into others;* and indeed they might be multiplied *ad infinitum*. After the right lateral obliquity, the anterior is the most common; that of the left side is pretty rare; and we may doubt the possibility of a posterior obliquity, which M. *Levret* and his followers only admit when the *lumbar vertebræ* are curved in a direction contrary to their natural state;† that is to say, when their assemblage describes a concavity forwards, instead of that convexity, which has hitherto appeared to me so much the greater, as the woman was more deformed.

236. If it was believed, at first, that the obliquity of the *uterus* was an effect of its bad conformation, of the relaxation of some of its *ligaments*, and the contraction of others; of certain tumours of the neighbouring parts, or of the habit which many women are in of sleeping only on one side; most authors, especially since M. *Levret*, attribute it to the attachment of the *placenta* to some other part than the *fundus* of the *uterus*. The most common cause of a deviation of the *uterus*, says that celebrated accoucheur, depends on that part of that organ on which the *placenta* is implanted; for if it is not fixed on the *fundus*, or on the orifice, it always draws that *viscus* to the side next which it is attached. The most common cause after this, continues M. *Levret*, is the original or accidental bad conformation of the *uterus*, or of some of its parts, or even of those in its neighbourhood.‡

* M. Levret l'Art des accouchemens, edit. troisieme, sect. 283, et suiv. sect. 638.

† L'Art des accouchemens, edit. troisieme, sect. 635.

‡ Ibid. sect. 633, 634.

237. The obliquity of the *uterus* seems to be a necessary consequence of the roundness it acquires in developing; of the figure and situation of some of the surrounding parts, of the mobility of others, and of the changes which their functions determine in them every instant: but what is the cause which obliges it to incline to one side rather than on the other? If the obliquity were caused by the implantation of the *placenta* in any other part but the centre of the *fundus uteri*, it would constantly take place on the side where that mass is found. But we often find it on the opposite side; and M. *Levret* himself furnishes a proof of it in the second case which he relates from M. *Buzan:* we there see that the *uterus* was very much inclined to the right side, though the *placenta* was attached to the left, and very near the orifice. The *uterus* is almost always inclined to the right side; and the *placenta* is not oftener attached to the right lateral part of that *viscus*, than to the rest of its surface.

238. It would be easy to prove that this mass cannot in any case oppose the development of that portion of the *uterus* to which it adheres, and does not by that means force the *uterus* to take an oblique form, as is asserted by M. *Levret*, nor even any other form than it would have acquired in developing, if the *placenta* had struck its roots in the middle of the *fundus*. All authors agree that the place where the *placenta* is engrafted is thicker than other parts; but they add that the *uterus*, in that same part, is softer, more spongy, and more humid. M. *Levret* has not a different opinion of it; for he expresses himself thus, sect. 279: "When the *pla-* " *centa* attaches itself to the *fundus* of the *uterus*, that " part of it preserves a great deal of thickness, " notwithstanding its prodigious extension at the " latter end of pregnancy."

239. The anterior obliquity is caused by the direction of the axis of the *pelvis;* the inclination of the superior *strait* in a well-formed *pelvis* is generally estimated from 35 to 40°; and the axis of this *strait* is inclined nearly as much, but in a contrary direction, as it descends from the *umbilicus* to a little above the point of the *sacrum;* the *uterus* cannot therefore rise through it but by inclining forward, and resting against the abdominal muscles; the support it finds from these, will be in proportion as they have been more or less weakened by former pregnancies. Therefore we may observe, that this species of obliquity is, cæteris paribus, greater each pregnancy.

240. It will perhaps appear more difficult to assign the true cause of lateral obliquities. I am inclined to think they are determined by the relation of the *uterus* to the *rectum*, and the Roman S of the *colon;* by the anterior convexity of the lumbar column, and the situation which the small intestines take relatively to the *uterus*, which lifts them up, in proportion as it advances in the abdominal cavity.

241. The relation of the *uterus*, developed and rounded in its body in the second or third month of pregnancy, with the *rectum*, which forms a sort of winding column along the *sacrum*, is such that those two parts cannot touch but by convex surfaces, and consequently by very few points, like two balls. Now, if we allow the *uterus* the mobility which it really enjoys in the midst of the *pelvis*, we shall be forced to agree that the centre of its posterior convexity cannot remain constantly against the convexity of the anterior surface of the *rectum*, which on each side offers its planes so much the more inclined, as it is then, though momentarily, more dilated by the *fæces*. This salient point of the posterior part of the *uterus* will then turn away, and

place itself on one of the sides of the *intestine;* which cannot take place without removing the middle of the *fundus* from the axis of the *pelvis*, and inclining it towards one of the lateral parts. If the *rectum* descended in a right line from the middle of the projection of the *sacrum* to the point of the *coccyx*, the space being equal on each side, the *uterus* would be equally subject to incline to either, and we should not see the right lateral obliquity oftener than the left; but being placed on the left side of the base of that bone, and leaving its curve less free on that side than on the right, the posterior convexity of the *uterus* is almost always directed towards the latter, and the centre of its *fundus* inclines that way preferably. This first degree of obliquity, which depends entirely on the relation of the form of the body of the *uterus* to that of the intestine, during its stay in the *pelvis*, is easily discovered by the touch, in most women, after the second or third month of gestation; the orifice of the *uterus* being from that time lightly turned to the left side of the *vagina*, and much more manifestly from the third to the fourth month.

242. The accumulation of *fæces* in the *rectum* and the extremity of the Roman S of the *colon*, and the direction of the course they must take to pass out, are additional determining causes of the right lateral obliquity of the *uterus;* since they press that *viscus* from left to right, and with so much the more force as that which expels them is itself greater.

243. These causes acting almost always in the same manner; and not being able to act otherwise, at least without a vicious conformation, a transposition of the Roman S of the *colon*, and of the superior extremity of the *rectum*—we ought not to be surprised that the *fundus* of the *uterus* inclines so

often to the right side, and so rarely to the left. Every attentive observer may in fact remark, that the right lateral obliquity is so frequent, and the left so rare, that perhaps we should be far from establishing the due proportion of one to the other, by saying that the latter is scarcely met with once, where the former is an hundred times. As the left lateral obliquity cannot depend on the same mechanism, nor on the attachment of the *placenta* to the side of the *uterus*, what must then be the determining cause of it? We can only attribute it to the concurrence of some of the accessory causes hereaftermentioned

244 The *fundus* of the *uterus*, already a little inclined, as observed in par. 241, cannot afterwards rise in the abdominal cavity, but in an oblique direction: so that the small intestines are obliged to give way to it, and go towards the left side; to which, according to the disposition of the *mesentery*, they seem to have a more natural inclination.

245. The convexity of the lumbar column very much favours the lateral obliquity; and might determine it, exclusively of any other cause, if it did not already exist, in a slight degree, before the *uterus* is raised above the superior *strait*. That *viscus* growing rounder and rounder, without losing any of its mobility, in proportion as its contents augment, cannot rest on that column, which offers it, on each side, spaces much better adapted to its figure. Supposing then that it has risen above the superior *strait*, till the fifth month of pregnancy, without turning away its axis from the axis of that *strait*, it would still be forced to change its direction, and incline to one side; because the greatest convexity of its posterior part, which would then answer to that of the second and third *lumbar ver-*

tebræ, could not rest on that point: it is in this manner that the left lateral obliquity must happen, when no other cause determines it accidentally.

246. It is by examining and feeling the belly of the woman that we form a certain judgment of the species of obliquity which exists, and of its extent, though it is sometimes apparent to the sight. Experience also proves that we may, at will, change the situation of the *fundus of the uterus*, by causing the woman to take a different position, while the neck of that *viscus* remains fixed against the same point of the *pelvis;* unless, by means of the finger passed into its orifice, we draw it to another part.

247. The obliquity of the *uterus* is in general of much less consequence than is commonly said. There is in fact, no accoucheur a little in vogue, who must not have observed, a thousand times, that the greatest obliquity of the *uterus* does not constantly disturb the mechanism of labour, nor always render it more tedious. I have assisted a great number of women who have been delivered in a few pains, though the *uterus* was so inclined forward, that the belly, like a wallet, fell down to the knees when they were standing.

248. When the obliquity is considerable, the neck of the *uterus*, commonly applied against some part of the sides of the *pelvis*, opens with much more difficulty than if it answered to the centre of the cavity, because the forces which tend to open it are then directed in such a manner as to be partly lost on the side of the *pelvis;* which renders the labour longer and more laborious.

249. In this case, if the membranes break early, if the action of the auxiliary powers is pretty strong, and the *pelvis* large, the child's head presents itself to the *vulva*, covered by a portion of the *uterus*,

which it has extended and forced to descend before it, while the orifice is carried farther and farther backward; which produces much greater accidents, if the accoucheur does not prevent them in time; by checking those efforts which depend on the will of the woman, by pushing back the child's head a little in the interval of the pains, and by drawing the orifice of the *uterus* under it, and towards the centre of the *pelvis*, and maintaining it in that situation. The two following cases appear to me very fit to demonstrate the disagreeable consequences of obliquity of the *uterus* in such circumstances, and the salutary effects of the conduct which I recommend. One of these cases is extracted from a memoir on the obliquity of the *uterus*, which was communicated to the Royal Academy of Surgery by M. *Bavaii*, surgeon-accoucheur in the states of *Brabant;** the other happened under my own care.

Case I. A woman of the village of *Grimberg*, near *Brussels*, pregnant of her first child, not being able to have M. *Bavaii* at the beginning of her labour, had recourse to a midwife who kept her standing, and made her bear down, whenever a pain came, during three days and two nights; so that the child's head appeared at the *vulva*, enveloped in the anterior part of the *uterus*, when this surgeon was sent for again. This portion of the *uterus*, which was like a cap on the child's head, was, says he, inflamed; and the orifice, which he could not discover without a great deal of trouble, answered to the superior part of the *sacrum*, and was not open

* This memoir is nothing but an abusive criticism of what the first edition of this work contains on the obliquity of the *uterus*, and only displays the ignorance of its author.

farther than the breadth of a sixpence: the waters had been drained off some days. Recourse was had to bleeding, clysters, and emollient fomentations; and M. *Bavaii*, being scarcely able to keep back the child's head, and prevent it from clearing the *vulva* enveloped in the portion of the *uterus* which covered it, thought of laying the woman so that the breech might be higher than the shoulders; and notwithstanding that, continues he, a gangrene came on, and the woman expired. Proceeding to open the body in presence of M. *Le Botte*, sworn surgeon of the Abbey of *Grimberg*, they observed that the *placenta* was attached to the middle and inferior part of the anterior *paries* of the *uterus;* that the *pelvis* was well formed, and very spacious; that the orifice of the *uterus* answered to the nape of the child's neck, the head having come out enveloped in a portion of that *viscus*, which was gangrened and separated from the rest. This case, in which I have in some measure preserved the expressions of the author, presents in a clear and alarming manner, the melancholy effects of an obliquity of the *uterus*, when the woman is left to herself, or committed to the hands of blind and temerarious ignorance. The following, on the contrary, demonstrates what we may expect from the assistance of art, when well directed. I have chosen it from among many which have fallen within my own observation, because it is impossible that any one can be more similar to that of M. *Bavaii.*

Case II. Towards the end of the year 1773, a woman, robust and well made, and who had already had several children, presented herself to be delivered in presence of my pupils; and by her obstinacy procured them an opportunity of observing perfectly the effects of obliquity of the *uterus*, when

it is not corrected seasonably, as well as what may be expected from the timely application of the precepts of the art. The *uterus* in this woman was manifestly inclined to the right side, and forward, so far, that its orifice, turned backward, was difficultly discovered by the touch. The waters broke away, and her pains were strong and frequent: the child presented well. Nothing could convince this woman of the necessity of remaining in a horizontal position, and of supporting the presence of the finger; she went on, sometimes sitting and sometimes standing, giving herself up inconsiderately to the most violent efforts, whenever she felt a pain; so that, after twelve or fifteen hours' labour, the child's head appeared to occupy the lower part of the *pelvis*, covered by the anterior and inferior part of the *uterus*, so much that it might be perceived in that state by separating the *labia*, and opening the entrance of the *vagina* a little. The finger passed over the whole spherical portion which presented itself in that manner, without finding the orifice, which was then thrown more backward, and as high as at the beginning: it was necessary to insinuate the finger almost to the base of the *sacrum*, to touch its anterior edge. The portion of the *uterus* pushed forward, and forming under the child's head a kind of cap which covered it entirely—more apparent still to the view in course of labour, because it approached nearer and nearer to the entrance of the *vagina*—was smooth, shining, tense, wonderfully injected, and covered with an admirable network of vessels. It became so extremely sensible, that the woman could not bear the slightest touch on it; and the whole *abdomen*, threatened with the same inflammation, was so painful that her clothes became troublesome. She was in a high fever, and

her ideas began to be deranged, notwithstanding several bleedings; when a fortunate incident rendered her sufficiently docile to listen to the advice which she had rejected for eight and forty hours, and to suffer the treatment which we would have put in practice from the beginning. Intimidated by the unexpected appearance of two men of the law, dressed in their robes, she laid herself on the bed: I raised up the belly with one hand, to diminish the obliquity of the *uterus;* while with two fingers of the other, after having pushed back the child's head a very little, I was able to hook the anterior edge of the orifice, to bring it towards the centre of the *pelvis*, where I kept it during a few pains; and then permitting the woman to bear down with the little strength she had left, she was delivered in the space of a quarter of an hour. Her child was healthy, and the subsequent symptoms were very simple. If this case were not sufficient to confirm the utility of this practice, I could support it with many others.

250. In women who have the *pelvis* rather narrow, the head, thus covered by a portion of the neck of the *uterus*, does not descend so low as in others; but in all, as the efforts which tend to push the head forward act perpendicularly on the portion of the *uterus* which covers it, that portion is distended, inflames, and tears, if we do not prevent those effects by correcting the obliquity of the *uterus;* and, if that be not sufficient, by bringing the orifice to the centre of the *pelvis*, and keeping it there till the head be engaged in it; as I have just recommended.

251. To prevent these effects we must then lay the woman on the side opposite to the deviation of the *fundus*, in order that the *uterus*, charged with the weight of the child, may incline that way; and

to this precaution we may sometimes be obliged to join that of pressing the belly to that side with one hand. We must moreover, in an extreme anterior obliquity, recommend to the woman not to bear down; because those efforts would become contrary to the end proposed, and would only augment the obliquity. If the orifice, by means of these precautions, does not approach the centre of the *pelvis*, after waiting a proper time, we must bring it thither with the finger during the absence of the pains, and keep it there till it be sufficiently open to allow the membranes with the waters to engage in it like a wedge. I can assert with confidence that the length of labour, in many cases, proceeds from the want of this favourable relation of the orifice of the *uterus* to the *pelvis;* and that the most certain means of accelerating the labour, and sparing the woman a great number of useless and fatiguing pains, consists in establishing that relation, in the manner I have just recommended. There is nothing to be feared from this procedure: it cannot produce a rent, nor inflammation of the neck of the *uterus*, nor flooding, &c.

Of the Menses.

252. The *uterus*, before the age of puberty, receives no more blood than is necessary for its nutrition and growth; but, from that age to forty-five or fifty years it suffers a periodical sanguine *plethora*, which is followed by a depletion more or less abundant, known by the name of *menses*.

253. Almost all women are subject to this evacuation; the derangement or suppression of which, ex-

cept during the time of gestation, or giving suck, seldom fails to injure their health.

254. The first and last appearance of the *menses* are sooner or later, according to the constitution of the woman, her manner of life, the country she inhabits, and an infinity of other circumstances. In our temperate climate, this evacuation begins about the twelfth or fourteenth year, and ceases between the forty-fifth and fiftieth.

255. It is not, however, extremely uncommon to meet with women who have had their *menses* sooner, or in whom they have ceased later. In some they appear even from infancy, and in others they have continued to an extreme age.

256. In a well constituted woman, the duration of this evacuation, and its periods, are almost invariable; but there are differences in each individual. In some women the blood flows during six or eight days, in others only three or four, or even less. So there are some who menstruate every twenty-seven, eight, nine, or thirty days; and others twice a month; and many only every six weeks or two months, and even seldomer. But there are very few who, like her mentioned by *Deventer*, have this evacuation only during their pregnancy.*

257. It is impossible to know the exact quantity of blood each woman loses every month, because the quantity is not the same in all, and because a great number of circumstances may make it vary: it is generally estimated at from three to four ounces.

258. As it is more easy to judge of the nature of this blood, we may affirm that it has not those nox-

* Deventer, sur l'Art des Accouchemens, chap. xv.†

† A case of this kind came under my notice in the year 1791 at Abington. W. P. D.

lous qualities which some have attributed to it. If it does not always appear so pure as that drawn from other parts of the body, it is because it is mixed with the humours of the *vagina*, or is corrupted by its continuance in that canal, or in the cloths which receive it.

259. The *menses* do not always come red at first; sometimes they begin by a discharge of *serum*, and finish in the same manner. Often also, in girls, they are preceded by acute pains, which, on account of their seat and nature, might make one think they are similar to those which succeed delivery, which are commonly called after-pains. The cause of both seems to be the same: all these pains depend on the fulness of the blood in the *sinuses* of the *uterus*, and the difficulty which it finds to escape.

260. The source of the blood of the *menses* is at present well known: we know that it distils from those openings which we observe in the whole extent of the cavity of the *uterus*, in the neck, and perhaps from the *vagina*. If there still remain any doubts on this subject, it is about what kind of vessels furnish it; for some maintain that it comes from the arteries, and others assure us it is discharged from the uterine *sinuses* or veins. For my own part, I think it comes from the uterine *sinuses*.*

261. We know not the cause of the periodical return of the *menses*. Most authors, by attributing it to a *plethora* of the *uterus*, have left us as much to seek as those who have ascribed it to another cause; since they have not determined what causes

* The sentiments of later physiologists on this subject are very different from that of our author; most are now of opinion, it is a secretion from the membrane immediately lining the *uterus*. W. P. D.

that *plethora*, nor why it returns constantly at the same period.

262. If this evacuation is an astonishing phenomenon, it is not less so to see it stop suddenly never to return, whether at the natural epoch, or earlier, without injuring the woman's health; while its smallest derangement, before that period, sometimes occasions such an infinity of accidents.

263. The cessation of the *menses* unfortunately does not always happen thus. They most frequently become very irregular before they arrive at that period: sometimes they are excessive, and sometimes flow in so small a quantity as scarcely to mark the linen: they often appear twice a month, and then stop for six weeks or more.

264. The time of the cessation of the *menses* is often justly called the critical time of women; for a very great number, overwhelmed by the infirmities which then attack them, ever after drag on a miserable and languishing life. That epoch is also in some women that of the return of their health, which the continual vicissitudes of this evacuation had constantly deranged.

265. The sterility of women who are entirely deprived of their *menses*, the suppression of that evacuation during pregnancy and giving suck, sufficiently declare that it is not a depuration, but merely a depletion, and that that blood had a much more precious destination. It is indeed so necessary for the development of the *fœtus* during pregnancy, and for the secretion of milk after delivery, that the *menses* in those two states have always been looked upon as an unnatural evacuation.

266. This general operation of nature, by which any individual produces its like, is called generation. This act, in animals, always requires the union of the two sexes, and cannot be performed without it; excepting some few who singly enjoy the power of reproducing themselves.

267. But this reproduction, is it only the development of a preexisting animal? And does it come from the father or the mother, or is it formed of the principles furnished by both? In the latter case, what are those principles, and how are they united? —These are questions impossible to resolve, or at least on which I shall risk no conjecture.

268. Neither shall I lose time in analysing the different systems established concerning generation; but shall content myself with mentioning them very briefly. They may be reduced to two principal ones; that of the mixture of the two seeds, and that of eggs.

269. The first was that of the ancients, who imagined that a woman discharges a prolific liquor in coition, like that of a man. This system, though generally adopted, had its detractors; and some even among the ancients maintained that the liquor in question was no more than an humour secreted by the glands of the *vagina:* in fact, if it came from the *ovaria*, how could it escape during pregnancy? To judge only by the sensation of pleasure, and that kind of *orgasm* which a woman feels in the region of the *fallopian tubes*, at the moment she gives herself up to the pleasures of *hymen*, it seems probable that some fluid flows from the *ovaria* towards the *uterus;* for that sensation cannot be excited by the

liquor which the woman emits without, since it is felt by the greater number independently of that apparent emission.

270. M. *de Buffon* has only embellished this first system. According to that learned naturalist, the man and woman furnish equally what is necessary for generation. Their seed, says he, is nothing but an assemblage of organical particles, extracted from all parts of the body, of which they form, as it were, so many epitomes. These organical particles, which he calls living and active, because of their continual motion, are so shaped and formed, that they cannot unite and assimilate but with the particles sent from the same parts of the other sex; that is to say, that the particles furnished by the eyes of the man, cannot be caught and united but by those furnished by the eyes of the woman; and so of the rest.

271. The formation of the parts of generation, so different in the two sexes, not being explicable by this ingenious system, the author's invention has supplied it, by supposing that the particles sent from one sex only, formed the basis of the whole edifice; and that it turned out a boy or a girl, as those particles belonged to the man or the woman.

272. The system of the ancients, mentioned above, maintained itself in full vigour till the discovery of the *vesiculæ* with which the *ovaria* of women are replenished at the age of puberty: that discovery immediately excited the attention of physiologists. It now began to be believed that man and all other animals come from eggs; and that all the difference between viviparous and the oviparous consisted in this—that the one, having hatched their eggs within, deposit their young alive; whereas the others hatch them after they are laid.

273. According to this system, adopted by the

greater part of the moderns, the fecundated egg descends into the *uterus* by means of the *fallopian tubes;* but has any one seen it? We may be allowed to doubt it, as well from the structure of the *tubes*, and the relation of the caliber of their internal extremity to the bigness of those little spherical bodies which we take for eggs; as from the numerous experiments of a philosopher who is the wonder of his age.*

274. The partisans of this system, though agreed on the admission of eggs, are nevertheless divided concerning the mode of their vivification. Some have thought that the *fœtus* was ready formed in the egg, and only wanted to be excited by the seminal power of the male; others, on the contrary, that those eggs were only a kind of nests destined to receive one of the little *animalcula* which have been supposed to be discovered in the *semen* by the help of a microscope.

275. The insufficiency of all these systems, and all these hypotheses, for explaining the surprising phenomena of generation, shews but too plainly the depth of that abyss, where the reason of man often wanders, for want of knowing the bounds which nature has prescribed to his intelligence and his researches.

Of Conception.

276. The union of the principles furnished by both sexes for the purpose of generation, in the human species, is called conception. If this union is not always performed in one of the *ovaria*, it will

* The Baron De Haller.

be agreed, at least, that it is performed there sometimes: since the remains of *fœtuses*, and even *fœtuses* entire, have been found in them.

277. Those that have been found in the *tubes* prove that conception may take place in them, or, at least, that those conduits may serve to transmit the body, which is the produce of it, to the *uterus*. Children which have been found in the cavity of the *abdomen* after the rupture of the *tube*, or of the membrane of the *ovarium*, furnish evident proofs of the place where conception is performed; and those which have been developed in that cavity, and had got thither without any injury to the *tube*, prove much less that it may be performed in them, than that it then had taken place in the *ovarium*.

278. Admitting that it takes place constantly in the *ovarium*, and that the *ovarium* is the first habitation of man, and that the *tube* is only destined to transport the fecundated egg into the *uterus*—ought we not to be surprised that so many eggs get into that *viscus;* and that the *tube*, whose extremity is so large, and whose internal orifice is so narrow, lets so few of them fall into the cavity of the belly?

279. Though some women know, as we may say, the very moment of conception, by the internal movements which they feel, the greater part never suspect that they have conceived till after the suppression of the *menses*. It would be a desirable thing however, in many cases, to have a certain knowledge of that state earlier, that we might not attribute the disorders which frequently accompany the beginning of pregnancy to other causes; nor employ medicines not only useless, but sometimes pernicious.

Of Pregnancy.

280. The state of a woman who has conceived is expressed by the word *pregnancy;* that state lasts from the first instant of conception to that of the exit of the body which is the result of it.

281. We may distinguish two general species of pregnancy, relatively to the nature of the produce of conception; viz. a true, and a false. The first is formed by one or several children; and the second by a mole, which sometimes is of a kind of fleshy substance, and sometimes *vesicular*, &c. We may also give the name of false pregnancy to those collections of blood, of water, and glairy humour, which are formed in the *uterus*, as well as to the *tympany* of that *viscus;* because they are always accompanied by some of the rational symptoms of common pregnancy; because, like that, they occasion a development of the belly, and may keep the most skilful accoucheur a long time in the greatest uncertainty concerning the true state of the woman.

282. A true pregnancy has received different denominations, according to the place occupied by the child. It is called an uterine pregnancy whenever the child is contained in the *uterus;* a *tubal,* an *ovarial,* or an *abdominal* pregnancy, when the child is found in one of the *tubes*, the *ovaria*, or in the cavity of the *abdomen.* These three latter species are also comprised in the generical name of *extra-uterine* pregnancy.

283. An uterine pregnancy is generally formed by one child, but sometimes by several; which has caused it to be distinguished into simple and compound. We may also call it a compound pregnancy, when the child is accompanied by a mole, and when

there is already an *extra-uterine* pregnancy existing; which is not without example, though we rarely meet with it.

284. These different species of pregnancy have some signs common to them all, and others which are peculiar to each of them. The former are, the disgust which the woman feels for certain things, strange longings, a spitting, nausea and vomiting, a suppression of the *menses*, a swelling and tension of the breasts, &c.

285. These symptoms, which are called rational signs of pregnancy, characterize it however in a very uncertain manner; and will appear very equivocal, if we recollect that they have been often observed in consequence of a simple suppression of the *menses*. The suppression of the *menses* is not a more certain sign of pregnancy, as their presence is not always a negative proof of it; some women being regular during the first two or three months of gestation, others having ceased to be so a long time before conception, and some few being so only during pregnancy.

286. Though the greater part of these symptoms united, or separate, offer us at most but probabilities concerning the state of the woman who experiences them; the particular signs which I am now going to describe, enable us to discover it from the first months, and to judge of its species, its different periods, &c. It is by touching that we discover all these things.

Of Touching.

287. Touching, considered relatively to the art of midwifery, is not confined to the introduction of the finger into the *vagina*, but comprehends also the application of the hand to the *abdomen* of the woman. It is by the former we discover the state of the neck of the *uterus*, its situation, &c.; but it is by the latter that we must judge of the volume of that *viscus*, of the height of its *fundus*, its obliquity, &c.

288. Touching is one of the most difficult and most essential parts of the art of midwifery. If *Deventer* and *Puzos*, who have given some important precepts on this subject, have left us much to wish for, it was because they knew, as well as many others, that in this article nothing can supply the want of practice.

289. Opportunities of practising it occur frequently, especially in great cities, where women are more numerous, and where persons of both sexes dedicate themselves solely to the profession of midwifery. A wish to dissipate doubts often determines women to submit to it; while at other times these researches concern the honour, the health and even the lives of several individuals. Sometimes it is a woman who fears she has become pregnant in an illicit commerce, who wishes to withdraw herself in time from the public eye, to secure her reputation, who implores information from our knowledge, as soon as her suspicions commence; sometimes a woman whose pregnancy still doubtful, is complicated with accidents, or accompanied by a disease foreign to it, who, not daring to employ the remedies her state seems to require, desires us to remove her uncertainty; at other times a woman

guilty of crimes which merit the extremest rigour, declares herself pregnant when she hears sentence of death pronounced upon her; lastly, the judges may require our decision on the state of a woman accused of concealment of birth, and *infanticide.*

290. It is by touching that we discover certain affections of the hidden parts of generation; that we judge of the size of the *pelvis*, and of its deformities; it is by that we discover pregnancy, its different periods, and the approaches of labour; that we distinguish the true pains from false, the part of the child which presents, its volume, the turns it makes in descending, &c.

291. To touch with advantage in most cases, and especially in discovering a doubtful pregnancy, in the first periods, we must begin by habituating ourselves to judge skilfully by this means of the natural state of the *uterus;* for it is the negative signs of that state which conduct us to the knowledge of the others.

292. In order to that, we should begin by touching dead bodies, where we may rectify our knowledge, and correct our errors; and then touch women not pregnant, in great number, and in different attitudes, to enable us to judge more exactly of the volume of the *uterus*, of the figure and situation of its neck, and of its weight and mobility.

293. We ought before we touch, especially if precision is requisite, to put the abdominal muscles in a state of relaxation; evacuate the water and *fæces;* to anoint the finger well we mean to touch with, that it may pass the more readily, as well as to protect it from any *virus* that may exist in the *vagina*. We must employ the forefinger; but we ought to learn to touch with both right and left.

294. We separate the *labia* with the extremity of the finger, pass it into the *vagina*, until we meet with the *os tincæ*. We examine this part and ascertain its length, thickness, density, and the state of its orifice—we agitate the *uterus* to determine its weight and mobility, and we endeavour to form an idea of its length by placing the other hand on the *abdomen*. With a view to this object, we place the finger behind the *os tincæ*, and raise up the *uterus* a little, while we search for its *fundus* just below the navel with the other hand; we shall know the *uterus* by its being round and solid; and estimate its length by determining in the mind the distance between the finger and the hand.

295. It is generally recommended not to touch until after the third month with the expectation of determining a pregnancy, as it is imagined that we cannot discover it sooner; but when we combine other circumstances with the information derived from touching, we may be enabled to form a judgment, that will not lead us into any material error.

296. In touching our chief attention should be directed to the changes produced on the body of the *uterus*, until the seventh month, and after this, to the neck; from an attention to the successive development of these parts, we determine a pregnancy, and its period. But as these changes may take place from a cause foreign to pregnancy, we cannot, strictly speaking, say that there is any certain sign of it, except the motions of the child.

297. These motions are of two kinds: one depends on the muscular action of the child's limbs; the other is a rolling motion, in which it is entirely passive. In one it moves itself in the *uterus*, and in the other it is moved in the midst of that *viscus*.

298. In the former kind it is sometimes the head, and sometimes the arms or legs, which it moves. These motions take place as soon as the muscles have acquired a sufficient force to produce them; but the mother is not commonly sensible of them till she is gone about half her time. Before that epoch these motions are too weak, and the limbs too imperfect, to strike forcibly against the *parietes* of the *uterus*, which a pretty large quantity of water then keeps distant from them in almost all parts.

299. Delicate and nervous women can however distinguish these motions sooner, as those of a contrary constitution do not perceive them till much later. I have known several who assured me they constantly felt the child move at three months, others a little sooner; but many when they drew near the period of four months. I have seen others who could not perceive these motions till after the fifth, the sixth, and even the seventh month. In one of these women, whatever we could do, and notwithstanding the very manifest rolling with which we agitated the child in the *uterus*, its motions did not become sensible to the mother, nor to the accoucheur who examined her, till the period of seven months, two months before its birth:* whence we see that we must not always take the time when those motions are first felt for the period of four months and a half.

* The birth of this child will not appear premature, when we observe that it was very strong, and weighed seven pounds and an half, or thereabouts.

I was several times in consultation concerning a woman whose pregnancy appeared doubtful to her till the last moment, as well as to the physician who had the care of her health; because the motions of the child could not in any way be perceived and nothing we could do, even at eight

300. The rolling of the *fœtus* in the *uterus* is independent of its muscular action; it exists after death, as before; it even seems, in that case, more troublesome to the woman, who complains that a kind of ball seems to her to fall to the side on which she lies. This species of motion depends on that of the *uterus*, and of the woman, and may be excited by the accoucheur.

301. This rolling commences, as I may say, with pregnancy; but it is so weak in the first periods, on account of the extreme lightness of the *fœtus*, that the accoucheur cannot discover it; and, notwithstanding the strictest inquisition, it cannot be perceived till towards the third, or even the fourth month. After that period it is easy to discover it, provided that we be prepared for it, by being accustomed to seek it in women farther advanced in pregnancy.

302. To excite and distinguish this rolling, we advance the finger introduced into the *vagina* to the body of the *uterus*, near the base of its neck, or as high as possible, either before or behind; and we apply the other hand over the *pubis*, in order to fix the *fundus:* we then agitate it upward and downward with the finger and with the hand, till we distinguish the movement in question; observing however not to mistake the motion of the *uterus*, for that of the child contained in it.

months and an half, could excite them: this child, which was as strong as usual, was nevertheless born healthy. M. *Levret* used to quote, in his private lectures, a case of a woman who felt no motion of the child in two successive pregnancies.†

† I knew a case where the motions of the child were never perceived, yet this child was born alive and healthy.
W. P. D.

303. The woman ought to be standing during all these researches, for an horizontal position would augment the difficulties; the body of the child then receding from the neck of the *uterus*, in proportion as the woman's breast is lowered relatively to the *pelvis*. Every person will comprehend this rolling motion, and the advantage of keeping the woman standing while we endeavour to excite and discover it, by considering that after the first months the *fœtus* is specifically heavier than the water which then surrounds it in great quantity, and that it must consequently occupy the lowest part of the cavity of the *uterus*, and fall on it again if we remove it by any kind of agitation.

304. This rolling motion characterizes a true pregnancy as certainly as the movements arising from the muscular force of the child; for a child is the only solid body which can be surrounded by a fluid in the *uterus*, and be moved in it in this manner: but this rolling, in which the child is absolutely passive, does not, like them, demonstrate whether the child be living or dead.

305. We have then, before the motions of the child are felt, nothing to prove a true pregnancy but conjectures more or less founded; the force of which augments in proportion as we can unite a greater number of these rational symptoms, which have caused doubts concerning the state of the woman.

306. The signs which touching discovers to us, and on which these conjectures are founded, must always be deduced from the state of the *uterus*. In the first two months of pregnancy the body of that *viscus* grows rounder, and seems to sink a little in the *pelvis*, which carries its orifice forward and downward, sometimes also backward and towards

the *coccyx*. The belly of the woman changes so little at that time, that the vulgar even think it flattens, instead of growing bigger. If it swells, that swelling cannot be referred solely to the augmentation of the *uterus*, but to an inflation of the intestines. This inflation ceases afterwards; and the belly appears no bigger at six months than it is sometimes accidentally at two.*

307. In the third month, the *fundus* of the *uterus*, more voluminous, begins to force the intestines upward, and to lift up the *hypogastric* region; because it is then manifestly above the edge of the *os pubis*. It is then the hand begins to discover it easily, by pressing on the aforesaid region.

308. When this development is caused by pregnancy, it is observed only in the body of the *uterus*, and the neck has no share in it: the kind of globe felt by the finger introduced into the *vagina*, and which may be distinguished by the other hand applied externally above the *pubes*, is regular in its surface, and has a sort of suppleness. This body, developed by a plethora of its substance, and affected by a chronical disease, is less regular, often unequal, and hard in certain parts. The neck is more or less affected by the same causes, and also altered in its figure.

309. If touching still leaves the accoucheur, whom a proper experience has not enabled to distinguish all these shades, in doubt concerning the state of a woman who supposes herself three months gone, he can have no doubt after the period of from three to four months. At this latter period, the

* La Motte and some others look upon a woman as having pretty certainly a false conception or mole, if her abdomen swells at the second month. W. P. D.

fundus of the *uterus* rises the breadth of several fingers above the superior *strait*. It rises to within an inch or two of the *umbilicus* in the course of the fifth; and the neck, receding farther and farther from the *vulva*, is carried backward and higher. The *hypogastric* region is then salient, rounded, and tight.

310. In the sixth month the *uterus* rises above the *umbilicus*, which seems less sunk in; the neck begins to enlarge at its basis, and seems a little softer than before.

311. In the seventh, the neck grows still shorter, and becomes less accessible to the touch, because it recedes from the *vulva* in proportion as it is developed: the *umbilicus* is more salient: and the *fundus* of the *uterus*, raised very high above that cicatrix, occupies a part of the *epigastric* region.

312. At the end of the eighth month, the *uterus* approaches so near to the pit of the stomach, in most women, that it is difficult to judge exactly how far it extends. Its neck is almost always effaced; and its orifice so far off, that the finger can scarcely reach it; and, to do it, we are often obliged to carry it as high as the *sacro iliac symphyses*, right or left.

313. In order to reach so far, we must proceed in the following manner:—The woman being standing, leaning a little backward, and resting her back against something solid, we place the hand open between the thighs, and introduce the fore finger into the *vagina;* so that the radial edge of the middle finger may lie along the *perinæum* and *coccyx*, and the thumb against the *pubis;* so that these two fingers and the thumb are at length very distant from each other. By proceeding thus we have advantages which cannot be obtained any other way; because the middle finger pressing upon the external parts of the *perinæum* and *coccyx*, forces

them upward, and diminishes so much of the depth of the *pelvis;* which permits the extremity of the forefinger to approach much nearer to the superior *strait* than if the hand were placed in any other manner.

314. In the last period of pregnancy the neck of the *uterus* is completely developed, and the edge of its orifice grows very thin in some women, while in others it seems to become thicker. This kind of increase, in that case, arises from an œdematous swelling which may be observed in the whole extent of the *puaendum*, and which spreads far in the cellular tissue of the *vagina* and neck of the *uterus.*

315. It is rare for labour to be many days distant when the edge of the orifice is very thin and soft; whereas it is often a month or six weeks off when this circle is hard and thick, whatever may be the diameter or degree of its opening. In fact, has not every accoucheur often found the internal orifice of the *uterus* large enough to permit him to touch the membranes with his finger, at seven months and a half, and even sooner, although the woman has not been delivered till the usual time? But there is no example of labour's being so far off when it is thin and soft.

316. The state of the membranes at the orifice of the *uterus* instructs us much more certainly concerning the period of labour. We ought always to look upon it as very near, when the membranes tighten and relax alternately. We may form the same opinion when the body of the *uterus* grows hard suddenly, and then softens and relaxes; and especially when this alternate tension and relaxation are remarked in the edge of its orifice.

317. Though all the symptoms constantly announce the approach of labour, they do not so certainly indicate the period of the ninth month; and.

to judge of that, we must also attend to the time of the suppression of the *menses*, and to that of the first motions of the child; to the volume of the *uterus;* to the size and hardness of the head, which we distinguish by the touch, &c.

318. The elevation of the *fundus* of the *uterus* above the entrance of the *pelvis*, as I have assigned it in par. 309, 310, 311, and 312, cannot serve to determine the periods of pregnancy stated in the same paragraphs, but in a woman big with her first child. I must remark that the *fundus* is a little lower, at each of those periods, in a woman who has already been pregnant several times; and I must add that the situation of the child may cause the same difference, it being less elevated when it is placed across than when well situated. We observe likewise that the neck of the *uterus* in its development, in a first pregnancy, changes the form of its inferior part but little, while its base enlarges; and its orifice does not open till the development is complete. But it opens much sooner in the subsequent pregnancies, and the *os tincæ* remains thicker in the latter months; so that experience is necessary, not to be deceived in these signs.

Of the Fœtus.

319. The rudiments of the *fœtus* appear at first only as a mucilaginous cloud, in the midst of a little bladder filled with a clear transparent water; nor is it till after some weeks that it is so far sketched as that.

320. The illustrious *Haller* assures us that he has observed nothing of the kind in sheep before the seventeenth day; and that it was not till the

nineteenth that he distinguished a mucous *fœtus*, of the size of a small worm, bent like a crescent:* which made him suppose that the human *fœtus* is not formed earlier. The observations I have made in practice coincide with that sentiment.

321. I have carefully examined many *embryos* no bigger than an ant: they were bent forward, as M. *De Haller* says, and enveloped in a mucous cloud. They appeared to the naked eye to have more resemblance to that little bone of the ear called *malleolus*, than to any thing else; having, like that, one end very thick, and the other extremely slender. Among the women who produced these *embryos*, some thought themselves a month gone only, and others five weeks; some of them were of the number of those who are generally able to tell the moment when they conceive.

322. I have seen a greater number of *fœtuses* about the size of a wasp. Their head formed more than half their mass; the eyes and mouth were very plain; the hands and feet seemed attached immediately to the *trunk*, the arms, thighs, and legs being scarcely visible. Some were of six weeks and others of seven, according to the account of the woman who conceived them.

323. All these *fœtuses*, as well those of a month as those of six weeks, were contained in a kind of *capsula*, as it were, spongy, or covered with a very thick down externally. Those of the former were nearly of the size of a middling hen's egg, and those of the others bigger.

324. These species of eggs are composed of two membranes: one external and thicker, on the sur-

* It is more than probable that this crescent form of *embryos* was produced from the action of the *alcohol* in which they were generally examined. W. P. D.

face of which rises the down already mentioned; that is the *chorion:* the other internal, thin, and transparent, through which we may see the body of the *fœtus* in the midst of the limpid waters it contains; that is the *amnion.*

325. These membranes adhere less together at the beginning of pregnancy than the external does to the *uterus;* on which account, in abortions that happen in the first periods, we often see those membranes separate from each other, and come away at different times. The *chorion* in those cases frequently tears at the orifice of the *uterus;* and the *amnion* containing the waters and *fœtus* immediately escapes, while the former is not expelled till some time afterwards.

326. In this case the woman discharges only a kind of membranous egg, without the least down upon it; and when the downy membrane comes away, if it be not examined attentively, it is usually taken for a clot of blood, because it is covered by a layer of that fluid.

327. It is doubtless observations of that sort which have made some believe that the egg is not downy at first, and that the *lanuginous* spot does not appear till it has acquired the size of a hen's egg, and the *fœtus* becomes as large as a bee.

328. The development of the *fœtus* is so slow at the beginning, and so rapid afterwards, that nature seems to have no difficulty but in the arrangement of its first lineaments. As soon as it is sketched, its increase is so sensible, from one month to another, and even from fortnight to fortnight, that it is difficult to conceive how such great and wonderful differences could be the work of so short a time.

329. These differences are not however absolutely the same in every individual. We observe, for example, as much variety in the length, bigness, and

weight of a certain number of *fœtuses* of five months, all proportions being observed, as in a like number at full time: some are longer, bigger, and heavier; others shorter, thinner, and lighter; so that we cannot exactly determine how far pregnancy was advanced by the dimensions and weight of the child, as some authors have asserted.

330. The usual length of a child at nine months is from eighteen to twenty inches, and the two extremes from sixteen to twenty-two or twenty-three. Their medium weight, according to the tables of *Roëderer*, is from six pounds to seven and a half. I have seen two of nine pounds three quarters, one of twelve, and another of thirteen pounds: the latter had several teeth well advanced, and others ready to cut; its bulk was so great, that I can scarcely believe there ever were any born of twenty-five pounds, or even fifteen, as we hear related by the good women.* I have seen some also at full time who weighed but five pounds, others but four and a half, and several of three pounds three quarters. These latter seem more common than those of nine pounds, and grow to as great a size after their birth.

331. According to these observations, we must conclude that there are children of eight months larger and heavier than others of nine, and *vice versa:* notwithstanding that, an experienced accoucheur will not judge them to be of the same term. There are always marks of immaturity in the exterior of a

* Instances have frequently occurred in this country, of children weighing more than fifteen pounds; I have seen I think several, two I am certain of, as I carefully weighed them. The circumference of the head of one, was eighteen inches and an half—round the shoulders twenty-one inches, and the length from the summit of the head, to extremity of the big toe twenty seven inches. W. P. D.

fœtus of eight months, though bigger than another at full time, which we see not in the latter, and which would be too tedious to describe here.

Of the Attitude and Situation of the Fœtus in Utero.

332. The *fœtus* is always bent forward, having the head inclined on the breast, the arms bent, the thighs and legs in the most perfect flexion, the knees separated, the heels near together, and placed against the breech.

333. The *fœtus* thus folded forms pretty nearly an oval body, whose greatest diameter is ten inches, or thereabouts; and its smallest, which extends from one shoulder to the other, from four inches and a half to six inches at most.

334. We must not however be contented with these general ideas of the child; we ought to make ourselves acquainted with the structure and dimensions of its principal parts, and the motions they are susceptible of; we ought by the touch to be able to distinguish the different parts it may present at the time of labour.

335. An accoucheur who has long been regarded as the most celebrated in his profession,* has advanced, that in the natural order, after the fourth month of gestation, the child is generally placed with the head above, the breech below, and the belly forward: while in the latter months we find the contrary; that is to say, with the head downward, the breech above, and the back under the anterior part of the *uterus*. Such was the idea of the ancients on the position

* M. *Levret*, sect. 426, et suiv.

of the child, and such is at present the opinion of most moderns. If there is no inconvenience, as some have said, in admitting the movement which they call the *summerset*, I think there is much less in rejecting it.

336. We find materials to combat the common opinion on this subject, even in the arguments of its partisans. By reflecting on the position which they give to the child till it makes the *summerset*, as well as that they assign it afterwards, we shall see, first, that it is the most inconvenient it can take, and the most difficult for it to preserve two moments together, if by chance it should exist one: secondly, that it is contrary to the relation and structure of its parts, as well as to the laws of gravitation.

337. First, The extreme smallness of the child in the two first months, when compared to the cavity of the *uterus;* secondly, the quantity of water which surrounds it, and the mobility it enjoys in it; thirdly, the weight of the head over the rest of the body; fourthly the bent form it is in, forbids us to believe it can remain months in a sitting posture on the lower part of the *uterus*. Beside, the *summerset* is said to take place at about the seventh month, a period when we shall find the great diameter of the child, (that is from head to breech) larger than any of the transverse diameters of the *uterus*, consequently cannot pass through them to effect the change spoken of.

338. The strongest arguments we can use against the *summerset* are founded in observation. The opening of dead bodies has a thousand times demonstrated that the child's head almost always occupies the inferior part of the cavity of the *uterus;* and it is generally the head which presents to the orifice in cases of premature delivery, at whatever

period of gestation it happens. If we have sometimes found the child placed differently, either in opening dead bodies, or in abortions, the proportion of these cases to those where the head presents, is nearly the same as what we observe at full time.

339. Therefore both reason and experience join to prove, that there is no such *summerset* as has been supposed; that the situation of the child varies continually in the first periods of pregnancy; and that it becomes fixed and constant in proportion to its augmentation, except in those cases where the *uterus* contains an extraordinary quantity of water.

Division of the Child.

340. The surface of the child, considered relatively to our object, might be divided into thirty-four regions, which however I shall reduce to twenty-three.

341. Of all the principal parts of the child, considered with respect to labour, the head must be allowed to be not only the most solid, but also the most voluminous. If the breast, in its natural state, appears larger in some directions, its structure is such that it always accommodates itself more easily to the mould of the *pelvis*. A similarity of structure obtains in the head by means of sutures, &c. by which the head is enabled to mould itself to the figure of the *pelvis* in some difficult labours. But it must be observed that when it diminishes in one direction, it almost always augments in another.

342. Although the child's head, at the moment of birth, be somewhat of an oval figure, we may

however distinguish in it five regions, two extremities, four diameters, and two circumferences.

343. Of the five regions of the head, two form the summit and base, the three others the sides and the face.

344. One of its extremities is superior and posterior; we call that the *occipital*, or *vertex:* the other is anterior and inferior, which is the *chin.* The first is thicker and rounder, the second narrower and longer.

345. The largest diameter of the head, the length of which is usually five inches and a quarter, passes obliquely from the *symphysis* of the chin to the posterior extremity of the *sagittal suture;* the middle diameter, which is about an inch shorter, extends from the middle of the forehead to the top of the *occiput;* the third passes from the summit of the head to the base of the *cranium;* and the fourth from one *parietal* protuberance to the other. The length of these latter is pretty constantly three inches and from four to six lines. It is proper to remark, that the breadth of the head is less below the ears than in the part indicated for the fourth or transverse diameter;* although many persons, without giving themselves the trouble to examine it, maintain the contrary.

346. The largest circumference of the head is nearly from thirteen inches and a half to fourteen or

* I shall hereafter call the first of these diameters *oblique;* the second, *longitudinal;* the third, *perpendicular;* and the fourth, *transversal.* Although the longitudinal diameter, which might also be called *antero-posterior*, is not the largest, as I have just observed, I give notice that that is the diameter I shall mean whenever in future I shall make use of the terms *great* or *large* diameter: and when I say *little* diameter, I shall always mean the transverse.

fifteen inches; the other is only ten or eleven. The latter passes transversely over the middle of the summit and base of the *cranium*, as well as over the *parietal protuberances:* the first, over the two *fontanelles*, the face, the chin, the *occipital foramen*, and the *tubercle* of the same bone; in a word, over the extremities of the oblique and longitudinal diameters, and over those of one of the two small diameters.

347. When the head lengthens in labour, it is always in the direction of the oblique diameter; so that the point of the cone which it then represents, is above the posterior angle of the *parietal* bones: but it cannot undergo this lengthening without diminishing in thickness from one side to the other, and often from the summit to the base.

348. These changes have limits however, which cannot without manifest injury be exceeded, they differ in different individuals, according as the head may be more or less ossified; the breadth of the sutures, or width of the fontanelles; they cannot therefore be precisely estimated. In some the *cranium* may lengthen with ease and safety, six or eight lines; while in others the slightest change is injurious.

349. The most remarkable *sutures* in the *fœtus* are the *coronal;* the *sagittal*, which extends to the root of the nose; the *lambdoidal;* and the *temporal*, or *squamous*.

350. The most considerable *fontanelle* is at the union of the *coronal* with the *sagittal suture:* it is called the *bregma*, or anterior *fontanelle;* its figure is nearly that of a lozenge. It was long believed, and is still believed by some, to have a pulsation; but nothing of the kind exists in it before birth.

351. The place where the *sagittal* and *lambdoidal sutures* join, is also called a *fontanelle;* though there

is scarcely ever any membranous space in it, as in the former. This *fontanelle*, which in the course of this work will always be called the *posterior fontanelle*, differs also from the preceding, in being formed of only three bony angles, and in being only as it were the point of union of three branches of *sutures:* while the anterior is composed of four angles, and as many *sutures* terminate in it; which makes them easily distinguishable by the touch.*

352. The articulation of the head with the *trunk*, its natural situation, and motions, are not less necessary to be known. The first is a species of *ginglymus*, which permits but very small motions, either forward, backward, or on the sides: if the head executes greater, they depend on the combined motion of all the *cervical vertebræ*.

353. These motions are freer in the *fœtus* than in the adult; but they have their limits, which cannot be exceeded without danger to the child; the pivot-like motion especially, which depends almost entirely on the twisting of the neck, cannot with safety be made to exceed a quarter of a circle. The natural situation of the head of the *fœtus* is such, that the chin is lower than the *occiput*, which makes

* We sometimes, though very rarely, meet with a fourth angle in the posterior *fontanelle*, because the *occiput* is then divided into two; and in that case there are likewise four branches of *sutures* which terminate in this *fontanelle*. Notwithstanding that, it differs so much from the former, that it is almost impossible to be deceived in it, even when we cannot touch them both, to compare them.†

† I have seen two instances in the same family, where there were three complete *fontanelles* in the course of the *sagittal suture*, the additional one was between the two common ones, that is, in the middle of the *parietal* bones. W. P. D.

the axis of the *trunk* pass a little before the posterior *fontanelle.*

354. The composition and motions of the *trunk* and extremities, are also essential to be known, as they have their direction and limits also. As the head cannot with safety be made to rotate more than a quarter of a circle, when we suppose the body the fixed part in the *pelvis*, so also, the *trunk* cannot be made to exceed this without injury, when the head is supposed to be the fixed part.

355. The fundamental principles of midwifery may be perceived, by comparing the principles thus far established between the *pelvis* of the mother, and the child to be born. We learn from them that delivery can only be effected, by having the *occiput* behind one of the *acetabula*, and the forehead before one of the *sacro-iliac symphyses* of the other side. It must descend so, that the *occiput* may turn under the arch of the *pubes*, and the forehead into the hollow of the *sacrum;* while the shoulders are to make similar turns, through the different *straits.* In those cases where the feet, knees or breech present, the shoulders and head must present their largest diameters to the largest diameters of the *pelvis*, &c.

Of the Secundines, or Afterbirth, and particularly of the Placenta.

356. These substances, although called *secundines*, are formed before the *fœtus*, at least before it is visible, if we except the *umbilical cord*, which is a production of the *hypogastric* vessels of the *fœtus.* It is evident these parts have important functions to fulfil, since they are sometimes found without a

fœtus, but never a *fœtus* without them. From the order of their development, it would seem, that they are nourished solely by fluids transmitted to them by the *uterus*, at least in the beginning of pregnancy. Under the name of *secundines* or *afterbirth* are comprehended the *placenta*, the membranes, and the umbilical cord; and we might add the waters to them.

357. The *secundines*, in the first months of gestation, are not such as we find them at the end: after several weeks, they are nothing but a kind of membranous bladder, on which we can scarcely perceive a rising down; but which in a short time is so covered with it, that the membranes no longer appear without separating the tufts of that down.—See par. 323.

358. This down is collected in a determined space and forms the *placenta;** at the full time of delivery it occupies about a fourth of the *chorion*.

359. The *placenta* is a spongy and vascular mass, thick in the middle, and thin at its edge: it is seven

* Our author appears to be in error here; the down, as he terms it, which is the spongy *chorion*, and which the *ovum* brings with it from the *ovarium*, cannot collect in a given point as he supposes, but only becomes more developed and extended by an increase of vessels, and an augmentation of circulation. The point of the *ovum* where this takes place is always that where the *funis umbilicalis* is inserted, and consequently opposite the belly of the child; which in the very early periods of gestation is found almost in contact with the internal face of the *amnion*, owing to the extreme shortness of the cord—in the more advanced periods of pregnancy, if we do not find the *placenta* occupying but a portion of the *chorion*, it is not because the spongy or flocculent part of it has collected itself into a given space, but because the membranes have been extended beyond the vascular *plexus* called the *placenta*. This is a wise provision of nature; for had the afterbirth occupied the whole surface of the *uterus*, few women would escape a fatal *hæmorrhagy*, when it became separated
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or eight inches in diameter, and twelve or fifteen lines thick in the centre, at full time. These dimensions however vary a little, according to the constitution of the woman, the strength of the child, and the part of the *uterus* on which the *placenta* is, as it were, grafted.

360. The *placenta* is always formed of several lobes, united by a cellular membrane, so fine and delicate, that the least force will tear it. Merely folding up this mass will separate its lobes, and make its external surface appear very unequal, and deeply furrowed; whereas in its natural state we only discover very superficial convoluted furrows, covered by a thin layer of cellular membrane, and which have a kind of resemblance to the anfractuosities of the brain.

361. It is now pretty well proved by experiment, that certain eminences observed on the external face of the *placenta* do not reach the uterine *sinuses;* the connexion between these bodies is by means of cellular membrane, in such a manner that, the uterine blood is deposited in it, from the *sinuses*, to be absorbed by the umbilical veins; consequently there is no necessity for an *anastomosis* of their vessels.

362. The internal surface of the *placenta* is lined by the *chorion* and *amnion;* and is nothing, it would seem, but an expansion of the cellular tissue of the former of these membranes. Whence it follows, that the *placenta* cannot be separated from it.

363. On some one portion on the internal face of the *placenta* we find an admirable plexus of arteries and veins; which serves as a base to the umbilical cord, of whose vessels it is only a ramification. The veins unite eventually in one *trunk* and form the umbilical vein. The arteries are a continuation of the primitive *iliacs* of the *fœtus.* When they arrive at the *placenta* they divide into very minute

branches, and *anastomose* with the veins. If one of the umbilical arteries be injected, the whole plexus becomes filled. The veins have no valves, but they are found most generally in the arteries.

364. When there are twins or triplets, we sometimes find as many *placentas* as there are children; at other times, and which is the most frequent, they are united through a certain extent of their edges, and seem to form but one mass; but, notwithstanding this connexion, there is scarcely any communication between their vessels, which may have great advantages.

365. Twins have however almost always something common to both, in those cases where there is a *placenta* for each; for they are enveloped in the same *chorion*, which unites the two masses of *placenta* so strictly, that we cannot extract one without the other.*

366. The *placenta* may attach itself indifferently on any part of the internal surface of the *uterus*. It generally occupies the middle regions; rarely the middle of the *fundus*, so as for its centre to answer to the centre of that; and more rarely fills the inferior part, or the orifice.

367. No sign can inform us before delivery what place the *placenta* occupies, unless it be on the neck of the *uterus*, or at least in its vicinity, and that the finger can discover it; but it is easy to judge of it after the exit of the child, by following the cord into the orifice of the *uterus*, and observing whether it descends from the posterior or anterior part, or from one of the sides. It is not till the *placenta* is delivered that we can estimate how far it was removed from the orifice, by attending to the distance from

* See the article on twins, at the end of this work.

the opening of the membranes to the centre of the internal surface of that mass. As that opening constantly answers to the orifice of the *uterus*, and as this latter is diametrically opposite to the *fundus*, whenever it shall be equidistant from all points of the circumference of the *placenta*, we may affirm that its centre answered to the centre of the *fundus uteri;* the nearer it approaches to the edge of the *placenta*, the farther that was removed from the *fundus*, &c.

368. Whatever may be the strength of the adhesion of the *placenta* to the *uterus*, it is only attached to it by a very fine cellular membrane, which is commonly very easily destroyed. We see nothing like that mutual reception which some talk of; and the firmer or weaker adhesion does not depend on the eminences of the one being more strongly or feebly engaged in the *sinuses* of the other.

Of the Membranes.

369. The bag in which the child is contained is composed of two membranes. The outer one or *chorion* is cellular externally, and especially near the *placenta*, by which it is attached to the *uterus*. It does not form a sheath for the *placenta*, but passes under it; for on the external face of the *placenta* we find nothing but an extremely fine membranous layer covering the anfractuosities mentioned in par. 360. The inner membrane or *amnion* is a very thin transparent membrane throughout its whole extent. It is united to the *chorion* by a fine cellular tissue, but its connexion with it however is less strict at the *placenta* than elsewhere. These membranes are con-

tinued over the *umbilical* cord. From the extreme tenuity sometimes of these membranes abortions have happened; as they have not been sufficiently strong, to bear the weight of fluid which presses on them.

370. Some anatomists make mention of another membrane, which might be regarded as the produce of conception, if it existed really, and separately from the two former, in every period of pregnancy: it is called *decidua*. We may see its situation and connexions, as well with the *uterus* as with the other membranes, in the tables of Dr. *William Hunter*, the first who has mentioned it. This membrane, *decidua*, does not seem to exist manifestly but in the first months of pregnancy, and is more considerable towards the lower part of the *uterus* than in any other part. It identifies itself so with the *chorion* in the latter periods, that we can no longer find it separate from that. I cannot admit it at any period as a particular membrane, but only as a layer of the *chorion*.

Of the Umbilical Cord.

371. The *umbilical cord* is known to all, but its structure is not equally so. It is formed of two arteries, and one vein, whose diameter is larger than those of the arteries. This structure is not however always the same, since we have seen many cords with only one artery.

372. These vessels, whose origin is already known, according to par. 363. wind round each other, like the twigs which form the handle of a basket: sometimes the arteries creep round the vein,

like ivy round a tree; and sometimes the vein does the same round the arteries. This vein often folds itself into a kind of loops of different lengths, or forms itself into a species of knots, subject to become varicous. These vessels are closely bound by the cellular tissue of the *chorion*, and send off no branch in the whole length of the cord.

373. They divide and subdivide on the internal face of the *placenta*, to form the *plexus* mentioned in par. 363; and they separate from each other at the posterior part of the *umbilical ring*. The vein ascends along the great *falx* of the *peritonæum*, towards the *scissure* of the *liver*, to enter the *sinus* of the *vena porta;* and the arteries descend towards the lateral parts of the *fundus* of the bladder, from whence they make a turn towards the *iliac* arteries, of which they are almost always a continuation.

374. The *umbilical* vein, as it approaches the *sinus* of the *vena porta*, sometimes divides into two branches, one of which, known by the name of the *venous canal*, is inserted into the *vena cava inferior*. When this bifurcation does not take place, the *venous canal* rises from the *sinus* of the *vena porta;* and that is what we find most frequently.

375. Another kind of cord rises from the top of the bladder towards the *umbilicus* of the *fœtus*, where it terminates; that is the *urachus;* it is almost always ligamentous throughout, and has no cavity, at whatever period we examine it.

376. We discover no nerves in the cord, any more than in the *placenta* and membranes; therefore those parts are insensible.

377. The *chorion* and *amnion* furnish a common sheath to the three umbilical vessels; and the skin of the *fœtus* advances about a finger's breadth on the cord, but growing thinner and thinner. It is al-

ways at the place where the skin terminates that the cord falls off from the *umbilicus*, at whatever distance from it, it be tied and cut.

378. The length of the cord varies very much, but it is commonly from twenty to twenty-two inches: the two extremes which I have seen, have been from six to forty-eight inches. There has since been seen another cord of fifty-seven inches, forming seven turns round the child's neck.*

379. The cord from its great length, sometimes gets tied into one or more knots. These do not prevent the ordinary development of the *fœtus* nor occasion its death as has been imagined by some.

380. There may when the head is delivered, an inconvenience arise from the cord being too short, either naturally, or from its being several times twisted round the neck of the child, such as a swelling, and lividity of the child's face, from the compression the jugular vessels suffer, from the cord being tightly drawn; and also a dragging, or separation of the *placenta*, and even a rupture of the cord itself.

Of the Waters of the Amnion.

381. The waters contained in the cavity of the *amnion* are usually clear, and without any disagreeable odour; sometimes they are whitish, milky, and full of flakes of a matter which appears like cheese.

* M. *L'Heritier*, master in surgery, was a witness of the fact at the Hotel-Dieu of Paris.

In some women they are muddy, thick like broth; sometimes they are greenish, brownish, or grayish, and of an odour singularly fetid.*

382. In the natural state, these waters have all the characters of the liquors of the *pericardium*, the *pleura*, and the *peritonæum;* being, like this latter, lymphatic, and a little greasy to the touch. They exude from the membranes by a mechanism exactly similar to that by which the liquor of the *pericardium* is supplied.†

383. The saffron colour, which agreeably to *Haller*, has been discovered in the waters of pregnant women who have taken much of this drug; and their property, according to *Levret* of whiten-

* They were found grayish, and of a consistence like mud, in a woman who was delivered in my amphitheatre; and they exhaled an odour so strong and disagreeable, that no one could remain near the bed.

† From the experiments of *Vauquelin* and *Buniva*, these substances would appear very different; their analysis furnishes the following component parts of the liquor *amnii*, viz.

98.8 water.

1.2 { Albumen, Muriat of Soda, Phosphat of lime, lime

100.0

While the liquors of the *pericardium*, *pleura*, *peritonæum*, &c. would seem to be nothing but *serum;* which from the experiments of the gentlemen just mentioned, was found to consist almost entirely of *albumen*, a little *soda*, and a small proportion of water or *serosity*. It has been asserted that, the liquor *amnii* when exposed to heat would like *serum* coagulate; this from the experiments just alluded to, appears to be a mistake. From the above analysis it seems that the liquor *amnii* contains but the third part of 1.2 parts of *albumen*, a quantity far too small to give it the power or property of coagulating, since, *serum* loses this quality when diluted with six quantities of water. W. P. D.

ing copper in women who have used mercury during their pregnancy, demonstrate that the liquor of the *amnios* is furnished by the uterine vessels.*

384. Although the source of the waters of the *amnion* is not dried up at any period of pregnancy, they are less abundant, relatively to the volume of the *fœtus*, in the latter months than at the beginning: but their absolute quantity is greater at the approach of labour than at any other time.

385. Nothing is more various than the absolute quantity of this fluid: some women scarcely discharge a pint or even half a pint, in time of labour, while others discharge many quarts.

* These proofs of the mother furnishing the liquor *amnii* are very equivocal indeed, and too much caution cannot be exercised in adopting them. Since our author wrote, many experiments have been made, which very much call in question the received opinions of that time; this has especially been the case with mercury. The experiments of Doctor Physick on this subject are conclusive as far as respects the observation of M. *Levret;* he found, that, neither by gold, nor copper, nor any other test, could the presence of mercury be detected in the *serum* of the blood, or *saliva* of people who were profusely salivated. These experiments were repeated, and varied in every possible way almost, without either the *serum* or *saliva* furnishing the smallest proof of the presence of mercury.

Besides, were it admitted that mercury did enter the circulatory system, and the liquor *amnii* of a salivated woman would whiten copper, and give the most unequivocal evidence of its presence in this fluid, would it prove this liquor to be the immediate product of the mother? by no means—the *fœtus* without doubt from its earliest formation derives its nourishment or fluids from the mother; and eventually red blood passes to it, and such red blood with little variation as circulated in the mother's vessels. If then the *serum* of the mother's blood contained mercury, the *serum* of the *fœtal* blood must also contain it, consequently when the thinner parts of this blood were eliminated from the *fœtus* to form the liquor *amnii*, they might, without doubt, carry with them a portion of mercury within the *amnios*. W. P. D.

386. They are one of the instruments which nature uses to effect the dilatation of the *uterus* in pregnancy, and the opening of its orifice in labour. These waters, on account of their lymphatic quality, have appeared fit for the nutrition of the *fœtus;* besides, they facilitate its motions, render them less troublesome and painful to the mother, and likewise diminish the too violent impression of external bodies on the child. Lastly, a modern author regards them as one of the agents of the first inspiration, and thinks they serve to cool the blood of the *fœtus*, which is difficult enough to comprehend.*

Of the Manner in which the Child is nourished during Pregnancy.

387. Though all physiologists agree that the child draws its nourishment from the mother, they are not agreed concerning the nature of the fluids it receives from her, nor on the manner in which she transmits them to it. Some think they are only white fluids, and others that it is blood.

388. It is more certain that the *fœtus* receives its nourishment by the umbilical cord; and the proof of it is so clear, that no one would dare contest it: but the same variety of opinions exists concerning the nature of the fluids transmitted to it by that canal.

389. The difficulty of passing the thinnest injections from the vessels of the *uterus* into those of the *placenta*, and *vice versa;* the milky humour

* M. *David*, Traité sur la Nutrition.

which we have seen draining from the *cotyledons* which supply the place of a *placenta* in ruminating animals, as well as the extreme delicacy of the vessels of the *embryo* in the first periods—have made the greater part of physiologists believe that the child receives none but white juices from its mother.

390. According to this opinion, it is the *fœtus* which forms its own blood, as we see in a chicken. Admitting that the blood which circulates in the vessels of the *fœtus*, among which we reckon those of the *placenta*, is formed in that manner; whence comes that abundance of blood which fills the vessels of the *placenta*, in the first periods of pregnancy, when the *fœtus* is nothing but a tender and delicate jelly, scarcely apparent to the sight; as well as that with which we find that mass so filled in those cases where we give it the name of *mole?* It is without doubt such observations as these which have made some believe that the *placenta* is the organ of sanguification for the *fœtus;* and others, that the mother transmits the blood to it ready prepared.

391. We cannot reasonably deny the passage of the blood from the *sinuses* of the *uterus* into the cells of the *placenta*. That which fills them before the *embryo* is, as it were, sketched, and in those cases where no *embryo* exists, as well as the floodings which succeed a separation of that mass from the *uterus* in every period of gestation, demonstrate it clearly. But we may be allowed to doubt its arrival at the *fœtus* in the first periods of its formation; because of the great disproportion which must exist at that time between the roots of the umbilical vein and the volume of the red globules. It is in the *placenta* itself that these veiny roots take up

the fluids necessary for the *fœtus*, and not in the *sinuses* of the *uterus*. If at first they absorb nothing but white and thin juices, they afterwards take up the blood itself, mixed with those same nutritious fluids; in the same manner as the *pudica* and *splenica* take up the blood extravasated in the cavernous texture of the *penis* and the *spleen*.

392. It is very true, that the blood of the mother does not pass immediately from the arteries of the *uterus* into the umbilical veins; and that that of the *fœtus*, brought back again by the arteries which accompany those veins, does not go directly into the veins of the *uterus*. There is no *anastomosis* between those two kinds of vessels; but there are cavities into which the blood is poured from both.

393. These reservoirs are the uterine *sinuses*, contiguous to the cellular cavities of the *placenta*, which I have mentioned above. The arteries of the *uterus* pour their blood into them, as the umbilical arteries do on the side of the *placenta*, where they are mingled, and taken up again by the veins of the same name; the one to return it into the general mass of humours of the woman, the other to conduct it to the *fœtus*.

Of the Circulation of the Blood in the Fœtus.

394. The blood taken up from the cells of the *placenta* by the roots of the umbilical vein, is poured into the *sinus* of the *vena porta*, where it is mixed with what that vein has received from other parts; and from thence it passes into the *vena cava inferior*, as well by the venous canal, as by the hepatic veins; to be transmitted into the left *auricle* of

the heart, along with the blood which returns from the inferior extremities, and from some parts of the breast and *abdomen:* while the right *auricle* receives from the *vena cava superior* what returns from the head and the superior extremities.

395. The left *auricle* pressing the blood which it has received from the *vena cava inferior*, and by means of the *foramen ovale* and the pulmonary veins, forces it into the left *ventricle;* as the action of the right *auricle* forces into the right *ventricle* the blood it has received from the *vena cava superior:* and those two *ventricles* distribute it anew to all parts of the body, and even to the *placenta.*

396. The left *ventricle* distributes it to all parts without exception, even to the lungs; since there is no part which does not receive its arteries from the *aorta* and its principal branches: but the right *ventricle* in the adult distributes it only to the lungs.

397. In the *fœtus* the blood propelled by the contraction of the right *ventricle*, is immediately divided into three columns; of those columns the two smallest go to the lungs, while the principal one is transmitted into the *aorta inferior* by the arterial canal, and communicates to the blood which has been propelled thither by the action of the left *ventricle* all the force which it has itself received from the contraction of the right *ventricle:* so that the fluid circulates through the *aorta*, and all its divisions, by the united force of the two *ventricles.*

398. The course of the blood carried by the *aorta inferior* of the *fœtus*, extends at least as far as the cavernous tissue of the *placenta;* since a part of that fluid is brought thither by the umbilical arteries. These, after transmitting a part of it into the veins of the same name, by means of the immediate communications which exist between them,

pour the rest into the cells of the *placenta*, and the cavities contiguous to the uterine *sinuses;* there it is mixed with the blood of the mother, and repairs the losses it has suffered by circulating through the *fœtus;* it undergoes a new elaboration; then returns to the child, loaded afresh with nutritious particles.

399. The circulation of the blood from the *uterus* to the *placenta*, from that to the *fœtus*, and *vice versa*, is performed thus till the time of labour; but it then undergoes surprising changes, some of which depend on the contraction and closing of the *uterus*, and the others on the respiration which is established in the child as soon as it is delivered.

400. In consequence of the contractions of the *uterus*, its vessels suffer some compression, which not only diminishes their diameter, but retards the circulation within them; so that the *sinuses* of the *uterus*, and cells of the *placenta*, receive and transmit less blood in a given time.

401. The retardment of the motion of the blood in the uterine arteries is in proportion to the contraction, and diminution of the *uterus* itself; so that in the beginning of labour it is much less, than when the labour is fully confirmed, and after the expulsion of the *placenta*. This is proved by the diminution of floodings during pain, their cessation after delivery, &c.

402. The effect of this contraction is not confined to the vascular system of the *uterus* itself, but extends to the *placenta* and child. The *placenta* pressed between the child's body and *uterus* so as to obliterate many of its cells after the evacuation of the waters, does not receive as much blood as before, either from mother or child. That of the mother passes with difficulty into the *sinuses* of the *uterus*, and is again taken up by the corresponding veins;

while that of the child instead of being pursued into the cells of the *placenta*, is returned to it by means of the umbilical veins without receiving a new mixture of the mother's blood.

403. This action becomes sometimes so violent, as entirely to destroy the circulation between mother and child; to this must be attributed the extravasations and congestions which are sometimes observed in a child, when a long series of efforts has been necessary to deliver it; hence the tumid and livid face of these children; their being nearly and sometimes quite apoplectic or dead; and hence the necessity in cases where there is still a little life, of immediately cutting the cord and depleting freely from it.

404. In general very little blood flows from the two extremities of the cord, cut near the umbilicus, as, for the most part the child respires immediately after its escape from the *uterus*, and the *uterus* almost as suddenly contracts. The almost immediate cessation of circulation in the umbilical arteries as soon as the child is born, is one of those surprising phenomena which has never been satisfactorily accounted for. Experience teaches us it depends on respiration, since the blood flows freely until this function is well established.

Division of Labour, of its Causes, its Signs, &c.

405. The general division of pregnancy into true and false, as well as custom, requires that we should distinguish labour, properly so called, from the expulsion of a mole, or any other body which might be the produce of conception.

406. When we consider the great disproportion

we meet with between different *fœtuses* at the same period of pregnancy, we cannot but agree that some may be born, with a probability of living, sooner, and others later, according to the strength and constitution of each; but in general that probability is greater, as their birth approaches nearer to the time of their perfect maturity; and we do not look upon them as *viable* till the period of seven months complete.

407. The causes which determine the birth of a child before the time fixed by nature, may also influence the probability of its living. One of seven months, for example, which comes naturally, is more likely to live than one of eight, whose birth is owing to a violent or accidental cause.

408. The most usual epoch of labour is the end of the ninth month of gestation, but it is not invariable. The child may be born sooner, or a little later. Some women are delivered naturally at seven or eight months; and others have carried their children beyond the ninth, without any reason to suspect an error in their calculation, or that they had violated their conjugal faith.

409. The exit of the child has received different denominations, according to the period of pregnancy in which it happens, or the mode of its operation. It is called a miscarriage, before the seventh month; delivery before the time, from that epoch to eight months and a half; and delivery at full time, when it happens in the latter part of the ninth month.

410. In respect to the mode of their operation, labours are called natural, preternatural, or laborious, &c. These scholastic distinctions being arbitrary, I shall divide them into three principal orders: 1. Those which are performed naturally, or with-

out assistance. 2. Those which require the help of art, but which may be performed by the hand alone. 3. Those which cannot be terminated but by the help of instruments, or in which it is useful to employ them.

411. If in these latter cases the action of the organs of the woman is not sufficient to perform the expulsion of the *fœtus*, at least it begins the labour: on which account all labours have some causes common, and some particular; which may be again distinguished into determining, and efficient.

412. The common causes of which we shall presently treat, are sufficient to effect deliveries of the first order. As to the particular causes, being different not only in each order, but in each species of labour, I shall not mention them till I come to treat of those labours to which they relate.

Of the common determining Causes of Labour.

413. The common determining causes of labour are, every thing capable of exciting the contraction of the *uterus*, in order to disencumber itself of its burden. Some are accidental, and produce abortion, or premature labour; the others appear natural, because they almost always act at the same period, and rarely before the end of the ninth month.

414. Naturalists have formed different opinions concerning these latter; some attributing them to the *fœtus*, and others to the *uterus* itself. The former have thought that the child, excited by the want of nourishment, the necessity of respiration, the troublesome weight of the *meconium* in the intestinal canal, &c. endeavours to get out, and overcome the

obstacles which oppose its passage. Others have imagined that the *uterus* was excited to contraction only by the acrimony of the waters of the *amnion*, or by the violent distention which it suffers at the latter end of pregnancy. But these opinions have been so completely refuted, that it is scarcely worth while to take notice of them.

415. It can neither be the necessity of respiration, nor the want of nourishment, which causes the *fœtus* to solicit its expulsion, when it has been some time dead: nor can it be the stimulus of the waters of the *amnion* on the *parietes* of the *uterus* (even if they were as acrimonious as some have asserted), nor the violent distension of the fibres of that organ, that provoke the efforts of labour, when it comes on prematurely; since the waters are not in immediate contact with the *uterus*, and it is not in this case distended to its greatest degree.

416. The true determining cause of labour at full time certainly resides in the *uterus:* this cause seems to me to act constantly during the whole time of gestation, though its effects are not usually sensible till the end of the ninth month. The distended uterine fibres continually endeavour to expel the bodies which affect them disagreeably. If they are not able to compass it in the first periods, it is because they are not all equally solicited to it; and because, not being all developed at the same time, the action of some is counterbalanced by the natural resistance of others.

Of the natural efficient Causes of Labour.

417. The vulgar suppose that the child is the principal agent of its birth; that it opens the parts of the woman by repeated efforts, and thus surmounts the obstacles which oppose its exit.

418. The expulsion of the child is a function entirely dependent on the strength of the organs of the woman. Two kinds of action concur in it; that of the *uterus*, and that of the muscles which surround the abdominal cavity. The former is the principal, the latter is only accessory.

419. The contractions of the *uterus* are always very weak at the beginning of labour, but augment insensibly, and become very strong. Those of the first periods are called preparative; and those of the latter, determining or expulsive. But instead of the word *contraction*, which is only understood by those who have studied the art, *pain* is generally made use of.

420. The pains, and calms, present great variety in different labours; they are sometimes shorter, and sometimes longer, no two individuals presenting the same phenomena, nor even the same individual is not held always alike in her different labours.

421. The effect of the contraction of the *uterus* is, to diminish its cavity in every direction. If the child, pressed on all sides, is forced out of it, it is because the resistance it meets with is not equal in all its parts; it always escapes at the place where there is the least.

422. If that place is almost always the orifice of the *uterus*, it is because its fibres are fewer in its vicinity than in all other parts; because it is diametrically opposite to the centre, which serves as a

fulcrum to all its fibres; because it is at the inferior part, and over the cavity of the *pelvis*, where it is no way fortified by the surrounding parts, as all other parts of the *uterus* are; and, lastly, because all the efforts of labour are directed towards that point.

423. When the orifice cannot open, if all parts of the *uterus* resist equally, nature exhausts herself in vain, and labour at length ceases: but if any part of that organ is weaker than the rest, it tears; and the child passes, either partly or totally, into the cavity of the *abdomen*.—See the article on the rupture of the *uterus*.

Of the Causes accessory to the Action of the Uterus.

424. The diaphragm and abdominal muscles have an important share in the expulsion of the *fœtus*. The efforts which the woman makes to relieve herself in the moment of pain call these parts into action, and are nearly the same as those made to expel the urine and *fæces*. In the first periods of labour, these efforts are subject to the will, but are no longer so, at the last moments.

425. By these efforts, the abdominal muscles and the *diaphragm* not only contribute to the expulsion of the *fœtus*, but becoming in some measure contiguous to the *uterus*, which they press, either mediately or immediately, on all sides, they serve for a support to it; and in many cases secure it from rupture, which without that support would be much more frequent than it is.

426. These muscles never act more efficaciously on the *uterus*, and the other abdominal *viscera*, than

when the bones to which they are attached are fixed and immoveable: therefore the contraction of a great number of other muscles becomes equally necessary in labour; but these latter only cooperate with the former in a very indirect manner.

427. While the *sterno-mastoidei* muscles, the *scaleni*, the *pectorales*, *major* and *minor*, the *serrati*, and others, fix the *thorax*, and prevent its obedience to the abdominal muscles, the greater part of those destined to move the thighs and legs do the same by the *pelvis*.

Of some of the principal Phenomena of Labour.

428. I THINK it is proper to explain some of the principal phenomena of labour; such as the pains, the dilatation of the orifice of the *uterus*, the discharge of *mucus* tinged with blood, and the formation of what is vulgarly called the gathering of the waters; before I indicate the order in which they manifest themselves, as well as several others which will be mentioned in the sequel.

Of Labour Pains.

429. THE pains are the first sensible phenomena of labour; it is they which announce it, and no woman can bring forth a child without them.

430. They appear to be the immediate effect of the contraction of the *uterus;* but that action must have passed through many degrees to become sen-

sible. In the beginning, that contraction is so slight, that it merely produces an internal sensation like that of a *tenesmus.*

431. The violence of the labour pains is always in proportion to the force of the contractions which cause them. They are so slight in the beginning of labour, that they seem only like a gentle pricking. If they are sharper towards the end, it is because the contraction of the *uterus* is stronger, its fibres are more stretched, and become more sensible, and they act on a body which gives them a greater resistance. The violence which the edge of the orifice then undergoes is but an accessory cause.

432. The labour pains do not always manifest themselves in the same manner. Sometimes they begin at the loins, and shoot downward; sometimes they are felt at the navel, or other parts of the *abdomen*, from whence they pass to the small of the back, where they torment exceedingly. The best are those which are directed towards the orifice of the *uterus*, or the fundament.

433. These pains of the back sometimes manifest themselves from the beginning of labour, at other times a little later; but they rarely continue to the end.

434. It has been attempted in all ages, to calm this sort of pains. Bleeding and emollient clysters have sometimes succeeded; but in general those means have been employed in vain, at least with respect to alleviating those pains. What seems most likely to relieve them is, to lift the woman up a little, during each pain, by means of a napkin rolled up and passed under the loins.

Of the Dilatation of the Neck of the Uterus.

435. The orifice of the *uterus* is almost always a little open before the epoch of labour. We see the reason of it by following, step by step, the order of the development of that *viscus*, and by attending to all that passes at its orifice in the latter periods of gestation.

436. The cause of this first degree of dilatation being well known, must throw the greatest light upon that which takes place in time of labour; and show us that it is not immediately and entirely the effect of that species of wedge which the substances subjected to the contractions of the *uterus* present to its orifice.

437. Although in many cases, where the waters drain off prematurely, no part of the child can engage in the orifice of the *uterus*, yet it does not fail to open, in the same manner as if the bag formed by the protrusion of the membranes were entire; from whence we see that the action of that organ is alone sufficient to effect the dilatation of its neck. But it will perform it so much the more easily as the *uterus* is more distended, and as the body it contains is more solid.

438. We must however allow, that the concurrence of all these causes renders the dilatation of the orifice more easy, and that it then requires fewer pains to effect it; for independently of the force which the membranes distended by the waters exert in the orifice, when they can engage in it like a wedge, the soft and gradual pressure which they continually make on all the neighbouring parts, determines a repletion in them, which favours their development, and renders it less painful.

439. In general, it requires more time and labour to open the orifice of the *uterus* the breadth of a halfcrown, than to obtain all the rest of the dilatation necessary for delivery. Young practitioners ought never to lose sight of this remark, when forming their prognostic on the duration of labour, that they may not expose women to be delivered alone, by supposing the time still far off, when very near.

440. Besides, the progress of this dilatation is not the same in all women, nor in all the labours of the same woman. Sometimes the orifice is more open at the beginning of labour, than at others after twelve or fifteen hours of strong pains; which depends on certain circumstances, which practice soon makes us acquainted with.

Of the Mucus, tinged with Blood, which drains from the Vagina.

441. The parts of the woman are more than usually moist towards the latter periods of pregnancy, and during labour; for the most part there is a discharge more or less abundant of a mucous serosity. This is sometimes tinged with blood, owing most probably to a rupture of some of the small vessels of the *placenta* or *chorion*. This is generally looked upon as a presage of a speedy delivery; but this is not always the case.

Of the Gathering of the Waters.

442. In proportion as the orifice of the *uterus* is dilated, the membranes are protruded through it, and form a tumour in the *vagina*, which is tense in time of a pain: this is what is called the gathering of the waters.

443. This tumour assumes various shapes agreeably to the situation of the mouth of the *uterus;* its degree of dilatation; or laxity of the membranes themselves; sometimes, circular, oblong, or extended like a pudding. The portion of the membranes which forms this tumour bursts from the impulse of the waters pushed forward by the contractions of the *uterus.* The time of this rupturing is however very various, sometimes happening at the very commencement of labour or even before; at other times not until the labour is well advanced or nearly finished.

444. When the membranes are delicate they burst at the beginning of labour, which sometimes renders it more tedious; not because it produces a dry labour, but because one of the causes which ought to cooperate in the dilatation of the orifice fails before it is effected.* If the membranes do not

* I am disposed to believe the reason labours are more tedious where the membranes prematurely give way, is to the *uterus* being unpreparedly thrown into contractions before the body and *fundus* have exerted their influence on the fibres of the neck, so as to dispose them to yield, and not to the loss of the waters as a mechanical agent. For we see many instances of the most perfect dilatation happen when the membranes are not protruded beyond the orifice of the *uterus*, and on the other hand, we see speedy delivery take place where the quantity of water escaped has been small and insufficient to excite the *uterus* to contraction, or where it has been abundant, but the *uterus* thrown into a state of torpor by the sudden depletion of the liquor *amnii.* W. P. D.

burst until the labour is at its height, the waters escape with a considerable jet, and the *uterus* is thrown into a state of inactivity for a short time; it however presently recovers, and now acts with increased force.

445. The membranes do not always burst spontaneously; and if we did not tear them in these cases, we should see the child sometimes born in its *involucra*, and bringing the *placenta* with it.

Exposition of the preceding Phenomena, and of some others, according to the Order in which they generally happen.

446. Labour is almost always announced by sensible alterations in the animal economy; but they are, as I may say, different in each individual. These symptoms are presently succeeded by slight pains in the loins, accompanied by a hardness of the uterine globe, and a kind of internal tightness which the woman can scarcely express.

447. Touching discovers to us that, at the instant of these pains, the orifice of the *uterus* contracts a little, that its edge stiffens, and that the membranes which cover it are more or less distended. All these symptoms augment in the course of labour, except the first; for the orifice afterwards, far from contracting, is obliged to enlarge at every pain.

448. In the second period of labour the pains become stronger and more frequent; the orifice of the *uterus* enlarges, its edge develops, and often becomes extremely thin; the tumour formed by the membranes becomes more considerable; and at every pain the child's head seems to go higher, so

that it is never farther from the finger that at this moment. The woman feels a weight below, which invites her to make some gentle efforts, like those caused by a *tenesmus;* and the neck of the *uterus* seems to descend a little, because the whole body of it is pushed towards the *pelvis* by the action of the abdominal muscles.

449. After the pain, things return to the same state they were in before; the edge of the orifice slackens, the membranes become flaccid, the child's head descends again, driving away the waters to the sides, and applies itself to the membranes.

450. In the third period of labour, which is that of its greatest force and violence, the pains succeed each other more rapidly; they are sharper and longer; the woman is more forcibly excited to assist them, and she supports them better than before. If the calm which succeeds each pain is shorter, at least it is quieter and more perfect; and is not commonly troubled by any of those uneasinesses which the first pains often leave behind. The orifice of the *uterus* augments so much, that it almost equals the whole breadth of the *pelvis.*

451. The glandular *follicles* scattered through the whole substance of the *vagina* and neck of the *uterus*, at this time discharge a greater quantity of *mucus;* and this is the time when that humour begins to colour more or less with the blood which escapes from the little ruptured vessels: so that it is the period of labour when some women mark the most, and in which the greater part begin to do it.

452. At this epoch likewise a great number of other symptoms appear, and the former acquire more force and intensity. The pulse becomes more hard and frequent, but it is almost always irregular; the face grows red, the eyes inflame, and the heat

extends to all parts; and the disorder of the whole frame becomes so general, that all its functions seem deranged.

453. The rupture of the membranes comes seasonably to calm this universal agitation, by the relaxation which the evacuation of the waters produces: but this repose is usually of short duration; still stronger pains soon disturb it, and give birth to new phenomena, which announce the termination of labour.

Of the Phenomena of the last Period of Labour.

454. The *uterus*, applied immediately to the child's body, after the evacuation of the waters, contracts more briskly than before. The head engages in the orifice, and approaches the *vulva* at every pain; so that, when all things are well disposed, the delivery is terminated in a very little time.

455. As soon as the head is completely in the cavity of the *pelvis*, many women complain of a want to go to stool; and some, for fear of discharging their excrements on the bed, dare not give themselves up to the efforts which they exerted before with so much success, and to which they are then so strongly excited; which more or less retards their delivery.

456. But this sensation is very often illusive: and if we were to permit all women who feel it to place themselves on the close stool, we should have the mortification to see some of them delivered in that attitude; which might have disagreeable consequences, either to themselves or their children.

457. When this sensation is felt, if the *perinæum*

yields easily, we see it stretch at every pain, on the child's head, which pushes it outward. The *vulva* dilates in the same manner, and delivery is soon terminated. But when it is thick and solid, and all the parts resist, as usually happens in a first labour, delivery is often several hours distant still.

458. In this latter case, though the *perinæum* distends, and is forced outward during every pain, it shrinks immediately afterwards; and the head, which was visible at the *vulva*, recedes, and returns again into the *pelvis*. These effects are repeated in the same order, till the *parietal protuberances* have passed below the anterior part of the *tuberosities* of the *ischia:* then the *perinæum* remains distended; and the head, which appears almost entirely enveloped in it, no longer remounts after the pain.

459. Accoucheurs generally attribute the return of the head, after each pain, to the twisting of the umbilical cord round the child's neck, and have proposed divers means for facilitating delivery in that case. It will perhaps appear surprising that I should rise up against so many authorities, and assign no other cause for this effect but the elasticity of the *perinæum*, and of the bones of the *cranium:* but reason and experience join to prove that it depends on no other.

460. When the head is so far descended as not to return again after the pain, the *perinæum*, then much distended and very thin, not being able alone to sustain the united efforts of the *uterus* and the abdominal muscles, is in the utmost danger of tearing. To prevent this accident, we ought to direct the woman to suspend or moderate those efforts which depend on her will; while the accoucheur supports the *perinæum* with the palm of one hand, in order to counterbalance the rest, till the external

parts be sufficiently dilated for the passage of the child.

461. At the moment when the greatest breadth of the head presents to the *vulva*, the *carunculæ myrtiformes* disappear, the *nymphæ* diminish, and the *fourchette* commonly tears. To this, the most painful moment of labour, succeeds a calm, till then unknown to the woman; and that calm, joined to the joy of being a mother, renders this instant inexpressibly agreeable.

462. But new pains would soon come, and disturb this delicious moment, if the accoucheur should abandon the expulsion of the child's trunk, and of the *placenta*, to nature alone; for the spontaneous exit of either could not be accomplished without a great number of contractions of the *uterus*.

463. In many women these pains are repeated during the first days of lying in. They are then excited by the presence of clots which are formed in the *uterus*, or by the fulness of the vessels of that organ; they are called *afterpains*. If the first labour is in general the longest and most painful, women are in some measure recompensed by the absence of these pains, which are much less common after the first, than after succeeding labours.

PART II.

Of Natural or Unassisted Labour, and the various Kinds of it.

464. If we comprehend in the class of natural labours all those in which the women might be delivered without help, we may divide them into four general species, each of which may be subdivided into particular ones. 1. Those where the child presents the head. 2. Where it comes by the feet. 3. Where it presents the knees. 4. Those in which it presents the breech.

465. A natural delivery always depends on the concurrence of several causes, some of which depend on the mother, and some on the child. It may be more or less easy or difficult, as these causes concur in a greater or smaller number; or according to the number that are wanting.

466. A good conformation of the *pelvis*, a sufficient degree of strength, a favourable situation of the *uterus*, a suppleness of its neck, and of the parts which form the *pudendum*, are, on the side of the woman, the conditions requisite for a natural delivery.

467. On the part of the child, its volume must not surpass the extent of the openings of the *pelvis*, and it must present to the orifice of the *uterus*, one of the parts indicated in par. 464; that is to say, the head, the feet, the knees, or the breech.

Of the first general Species of Natural Labour, or that in which the Child presents the Head.

468. By this generical term, of a child presenting the head, I give notice that I mean only that region of it called the *vertex;* intending to speak of the others in another place.

469. This first general species of labour, which is the most natural in all respects, has in itself essential differences, relatively in which the head may present to the superior *strait.* Among the various positions which the region of the *vertex* is susceptible of, I shall distinguish but six, which will constitute so many particular species of labour.

Distinguishing Signs of the Vertex, and of its Different Positions.

470. A round tumour, of a certain extent, and pretty solid, on which we may distinguish several *sutures* and *fontanelles*, characterizes the *vertex*, or the superior part of the head.

471. It is the direction of the *sutures*, and the situation of the *fontanelles*, with respect to the *pelvis*, which enable us to judge of the position in which the *vertex* or crown of the head presents. It is often sufficient for that purpose to touch either of the *fontanelles.*

472. In the first position, the *sagittal suture* cuts the *pelvis* obliquely from left to right, and from before backward. The posterior *fontanelle* is situated behind the left *acetabulum*, and the anterior before the right *sacro-iliac symphysis.*

473. In the second position, the *sagittal suture* also traverses the *pelvis* diagonally, but passes from the right *acetabulum* to the left *sacro-iliac symphysis;* so that the anterior *fontanelle* is before the latter, and the posterior behind the former.

474. In the third position, the posterior *fontanelle* answers to the *symphysis* of the *pubes*, the anterior to the *sacrum*, and the *sagittal suture* is parallel to the small diameter of the superior *strait*.

475. In the fourth position, this *suture* is directed as in the first; with this difference, that the anterior *fontanelle* answers to the left *acetabulum*, and the posterior to the right *sacro-iliac symphysis*.

476. In the fifth, the *sagittal suture* is likewise directed obliquely with respect to the *pelvis;* the anterior *fontanelle* being situated behind the right *acetabulum*, and the posterior behind the left *sacro-iliac symphysis*.

477. Lastly, in the sixth position, the anterior *fontanelle* is behind the *symphysis* of the *pubes*, and the posterior before the *sacrum;* the *sagittal suture* being directed as in the third position.

478. Some of these positions are not met with so frequently as others. It has appeared to me that the proportion of the first to the second, was as seven or eight to one; and to the fourth and fifth, as eighty, or even an hundred to one: as to the third and sixth positions, they are excessively rare; though most accoucheurs have thought, and still think, that the third is the most natural and usual.

479. These six positions not being equally favourable to the exit of the child, may be distinguished into good and bad. For the head to be well situated, it must present diagonally to the superior *strait*, and in such a manner that the *occiput* may turn under the arch of the *pubes*, as soon as it is de-

scended into the cavity of the *pelvis*. The two first positions are the best; the third may also pass for such, when the *pelvis* is of the natural size. The others, and especially the sixth, would often justly merit the title of bad positions, if the dimensions of the child's head were not pretty constantly much smaller than those of the *pelvis* of the woman: for notwithstanding this favourable relation of the head to the *pelvis*, yet it cannot disengage from it in all these cases without a great deal of trouble; as we shall see in the sequel.

480. The best positions of the head with respect to the superior *strait*, are not so with respect to the inferior; for it cannot take a more favourable one at the latter, than that where the *occiput* answers to the arch of the *pubes*. The head may also engage in the *pelvis* in such a manner as to meet the greatest obstacles to its progress, though it had at first presented in the most advantageous position at the superior *strait;* which depends on the concurrence of several causes, whose presence adds so considerably to the natural difficulties of labour, that we are often obliged to lend our assistance to terminate it.

481. It is necessary then, for the easy performance of this function, that the head, besides the conditions already stated, should follow a determined course: but different, in some respects, in each of the six positions which I have established.

Of the Mechanism of Natural Labour, where the Child presents the Crown of the Head in the first Position.

482. When we consider the position of the head which constitutes this species of labour, it is easy to figure to ourselves the situation of the *trunk* and other parts of the child in the *uterus;* and to see that the back, and hind part of the head, answer to the anterior and left lateral part of that *viscus;* the face, the breast, and the knees, to the posterior and right lateral part; the feet and breech being situated towards the *fundus*.

483. In the natural order, the first contractions of the *uterus* bend the head on the anterior part of the *trunk*, till the chin rests against the upper part of the breast. During this time the posterior *fontanelle* approaches more or less to the centre of the *pelvis;* and the head in that state of flexion continues to descend in the direction of the axis of the superior *strait*, till stopped by the inferior part of the *sacrum*, *coccyx*, and *perinæum:* one of the *parietal protuberances* passing before the left *sacro-iliac symphysis*, the other behind the right *acetabulum*.

484. The touch discovers to us that a little more than the posterior and superior fourth of the right *parietal* bone then answers to the arch of the *pubes;* that the right branch of the *lambdoidal suture* answers to the left limb of that arch; and that the other branch of that *suture* is towards the left *ischiatic* notch.

485. The head cannot remain long in that state; pressed by new efforts, and not being able to follow its former direction, it passes forward along the in-

clined plane offered it by the *sacrum*, the *coccyx*, the *perinæum*, and sides of the *pelvis;* but in such a manner that, in descending thus, the *occiput* turns by a pivot-like motion under the arch of the *pubes*, with which it has a strong relation, both in its form and dimensions.

486. This pivot-like motion, by which the *occiput* turns under the *pubes*, depends entirely on the twisting of the child's neck: we may estimate it at about the sixth or eighth of a circle. It is very necessary to observe that, during this motion of the head, the trunk executes nothing of the kind in the *uterus*. After this rotatory motion, we find the posterior *fontanelle* towards the middle of the arch of the *pubes;* from whence the *sagittal suture* goes backwards, rising obliquely towards the projection of the *sacrum* under which the anterior *fontanelle* is then situated. Each branch of the *lambdoidal suture* crosses the common branch of the *ischium* and *pubis* of the same side; and the nape of the neck rests against the inferior edge of the *symphysis pubes*.

487. The chin, which had been applied to the breast, begins at this period of labour to recede from it; and the *occiput* engages under the *pubes*, dilating the *vulva*, and rising up before the *mons veneris;* or, which is the same thing, turning backward, if we speak only with respect to the child.

488. In this last period the head describes almost a quarter of a circle, turning round the inferior edge of the *pubes*, like a wheel round its axle-tree. In this movement, the centre of which is the nape of the child's neck, the *occiput* passes through a very small space in rising towards the *pubes* of the mother; while the chin describes a very extensive curve behind, passing successively over every point of a line which would divide the *sacrum*, *coccyx*, and *perinæum*, longitudinally into two equal parts.

489. In this species of labour, the shoulders, which had engaged obliquely in the superior *strait*, present themselves differently at the inferior. The right shoulder turns towards the *pubes*, and the left towards the *sacrum;* so that their greatest breadth becomes parallel to that of this *strait*. After this change, the left shoulder continues to advance towards the bottom of the *vulva*, where it appears before the right has disengaged from under the *pubes*.

490. The shoulders being delivered, the rest of the *trunk* comes along with the greatest facility, on account of its conical and lengthened form.

491. By following step by step the course I have just traced from observation, it will appear, 1. That in all periods of labour the head presents its smallest diameters to the *pelvis*, and that it passes through it presenting only its smallest circumference. 2. That it executes three different motions in this passage: that of flexion forward, in the first period: the pivot-like, or rotatory motion, in the second; and, lastly, that of flexion backward, at the time it disengages from under the *pubes*.*

492. Nature cannot deviate from this course, but the delivery must in consequence become longer and more difficult; and often impossible without assistance.

* The student's attention is begged to these truths.
W. P. D.

Of the Mechanism of Natural Labour, where the Child presents the Crown of the head in the Second Position.

493. This position of the head, whose characters are described in par. 472, will appear as favourable to the exit of the child as the first, if we only attend to the relation of the dimensions of the head to those of the *pelvis*.

494. Nature however often finds obstacles in this second position, which she very rarely meets with in the first: the right lateral obliquity of the *uterus*, which is much more frequent than the left; the situation of the *rectum* with respect to the *sacrum*, and the hardened *fæces* which it often contains—appear to be the principal sources of them. The first of these causes obliges the head, as it engages in the *pelvis*, to follow that disadvantageous course indicated in par. 950; and the second obstructs the rotatory motion by which the *occiput* must turn under the *pubes* in the last period: the *rectum*, on the left side of which the forehead is then placed, hindering it from passing freely into the hollow of the *sacrum*.

495. The mechanism of delivery in this position, when the *uterus* has not deviated, and all other things are well disposed, is entirely similar to that of the first position. The *occiput* descends in the same manner into the cavity of the *pelvis;* and afterwards turns under the arch of the *pubes*, and disengages itself by turning on the inferior part of the *symphysis*, while the chin describes backward a very long curved line, as stated in par. 488.

496. As soon as the head is delivered, the left shoulder presently places itself under the *pubes;*

and the right goes towards the *sacrum*, to advance in the order indicated in par. 489.

Of the Mechanism of Natural Labour, where the Crown of the Head presents in the Third Position.

497. Most accoucheurs, even at this day, imagine that the head generally presents in this position, see par. 473.

498. This third position will perhaps appear less advantageous than the two preceding, because the longitudinal diameter of the head is parallel to the smallest diameter of the superior *strait;* but if we recollect that this latter is generally four inches in extent, and that the diameter of the head in question scarcely ever advances foremost, we shall see that delivery may sometimes be as easy in this case as in the former.

499. When the *uterus* is not inclined to either side, the head engages in the *pelvis* according to the usual laws; the *occiput* descends behind the *symphysis* of the *pubes*, while the chin rises towards the breast; so that the head only presents its height, or perpendicular diameter, to the small diameter of the superior *strait*.

500. As soon as the *vertex* is arrived at the inferior part of the *sacrum*, we find the *occiput* placed under the arch of the *pubes* to which it naturally answers in this position; and the head disengages as in the two former (see par. 487, and 488.) After that is disengaged, the shoulders present at the inferior *strait*, as stated in par. 489; but sometimes it is the right shoulder which goes backward, and

sometimes the left: whereas in the other positions their course is almost constant.

Of the Mechanism of natural Labour, where the Crown of the Head presents in the Fourth Position.

501. In this species of labour, the position of the head (see par. 474) is such, that its delivery becomes exceedingly difficult when the *pelvis* is not extremely large, relatively to the volume of the head; because the face turns gradually upward, and presents the forehead to the arch of the *pubes*. When every thing is in the natural order, the *occiput* descends into the *pelvis*, passing before the right *sacro-iliac symphysis*, till the posterior and superior part of the right *parietal* bone rests on the lower part of the *sacrum*. At this time, the head being obliged to turn on its pivot, the *occiput* passes into the curve of the *sacrum;* and the forehead sliding along the inclined plane of the left side of the *pelvis*, goes under the *pubes*.

502. It sometimes however happens, but unfortunately for the women too seldom, that the head in its descent approaches to the second position; so that the *occiput* turns forward instead of going into the curve of the *sacrum*.

503. These examples of the fourth position reduced, as it were, spontaneously to the second, and from that to the most usual one at the inferior *strait*, indicate what we ought to do, in order to save the woman from the difficulties of this species of labour; for, by attempting it early, the accoucheur may always determine the head to take that favourable direction.

504. The forehead being placed under the *pubes*, as stated in par. 501, we find the anterior *fontanelle* at the middle of the arch, and the posterior above the point of the *sacrum*. While this latter continues to advance forward along the *coccyx* and *perinæum*, the forehead, placed opposite the arch of the *pubes*, and not being able to engage in it as the *occiput* does in the former positions, is obliged to remount behind the *symphysis*, against the inferior edge of which the anterior *fontanelle* is then strongly pressed, till the posterior appear at the bottom of the *vulva*.

505. At that instant the anterior edge of the *perinæum*, much more distended than in the former positions, not being able to remain on the summit of the inclined and slippery plane of the occipital region, retires backward towards the child's neck. There it becomes the centre of motion on which the head must turn, in disengaging from the *pelvis*.

506. In this fourth species of labour the *occiput*, as soon as it is delivered, turns backward on the *perinæum*, or towards the *anus* of the woman, while the face disengages from under the *pubes*, and the chin describes a curved line, of the same extent as that it describes backward, in the three former positions, before it appears at the bottom of the *vulva;* but in a contrary direction. The chin scarcely appears without, before the face turns half round towards the mother's left thigh, as if to look at the groin of that side. During this time the left shoulder places itself under the *pubes*, and the right goes towards the *sacrum*, to disengage first.

Of the Mechanism of Natural Labour, where the Child presents the Crown of the Head in the Fifth Position.

507. The relation of the dimensions of the head of the *fœtus* to those of the *pelvis* of the mother, in the position which constitutes this species of labour (see par. 475,) being absolutely the same as in the preceding, the mechanism by which the expulsion of the child is performed must, *cæteris paribus*, be also perfectly the same.

508. The *occiput* descends first into the cavity of the *pelvis*, passing before the left *sacro-iliac symphysis*, as it does before the right in the fourth position. It afterwards turns towards the middle of the *sacrum;* while the forehead, sliding along the right side of the *pelvis*, places itself under the *pubes:* after which the whole passes in the order stated in par. 504 and following; except that, when the face is delivered, it turns obliquely towards the right groin; the right shoulder slides under the *pubes*, and the left towards the *sacrum*, in order to follow the course which has been already assigned them.

509. Sometimes the *occiput*, instead of turning towards the *sacrum*, gradually approaches the left *acetabulum*, in proportion as the head descends in the *pelvis;* so that this fifth position is insensibly reduced to the first. If the efforts of nature do not always reduce the head to this advantageous position, in this species, at least they point out the course we ought to make it take, in order to procure the woman this often inestimable advantage.

510. Sometimes also this species of labour, often difficult in itself, on account of the tendency of the face to place itself under the *pubes*, in proportion

as the head descends in the *pelvis*, becomes much more so, from accidental circumstances, and especially from a left lateral obliquity of the *fundus uteri*.

Of the Mechanism of Natural Labour, where the Crown of the Head presents in the Sixth Position.

511. This species of labour is the most rarely met with of any, where the crown of the head presents; the cause of which no doubt is, that the back of the head being round, and very slippery, cannot, on account of the mobility which the child enjoys till after the evacuation of the waters, remain against the projection of the last *lumbar vertebra*, which offers it, on each side, spaces better adapted to its figure.

512. Though this species of labour, in which the face comes upward, is allowed by all accoucheurs to be the least favourable of the six, it is also very happily the least common. Its difficulties depend much less on the presentation of the length of the head parallel to the entrance of the *pelvis*, as some perhaps may think, than on the inevitable presence of the face under the *pubes* in the last period.

513. In the sixth position of the head, when the *pelvis* is well formed, the *occiput* descends before the *sacrum*, as it does before the *sacro-iliac symphyses* in the fourth and fifth positions. The posterior *fontanelle*, which we always take for a guide, passes successively over every point of the curved line mentioned in par. 488, to present itself at the middle of the crescent formed by the lower part of the *vulva*, when the *perinæum* is much distended. At this instant the anterior edge of the *perinæum* retires

towards the *anus* of the woman and the neck of the child, as observed in par. 505; the *occiput* immediately begins to turn back the same way; and the face disengages from under the *pubes*, according to the course indicated in par. 506.

514. As soon as the chin is delivered, the face turns towards one of the woman's groins; but indifferently towards the right or the left, without our being able to assign a particular reason for it.

515. The shoulders soon afterwards present their greatest breadth to the length of the *vulva;* one of them turning towards the *pubes* the other towards the *sacrum;* in order to disengage as in the five former species of labour which I have just described.

Of the Second general Species of Natural Labour, or that in which the Child presents the Feet.

516. Although experience has frequently proved that a woman might be delivered without help, of a child presenting the feet, it is still customary to class this sort of labours among those called preternatural, and to treat them as such. I shall not examine scrupulously whether it be right or not; considering here purely and simply as natural, those labours where the child presents the feet: I reserve to myself the liberty of treating their particular indications, according to circumstances in another place.

Of the Signs which indicate that the Child presents the Feet.

517. Those labours where the child presents the feet, come on in the same manner as the preceding, and are accompanied by the same phenomena, till the opening of the membranes.

518. It is generally so easy to distinguish the feet, that I think we may dispense with a description of their characters; but it is not always so easy to discover their true position, and judge by that of the position of the *trunk* and head of the child in the *uterus;* because of the extreme mobility of the legs and thighs, and even of the feet. Indeed we need not trouble ourselves much about it, before these latter, and even the breech, appear without; since the greatest difficulties of labour, in these cases proceed only from the volume of the shoulders and head, or from the manner in which those parts present at the superior *strait*.

519. Relatively to these latter parts we shall distinguish four principal positions, to which all others may be referred. These four positions will constitute so many species of labour.

520. In the first position of the feet, the heels answer to the left side of the *pelvis*, and a little forward; the toes to the right side, and backward, nearly opposite the *sacro-iliac symphysis*. Above that *symphysis* are placed the breast and face: while the back is situated under the anterior and left lateral part of the *uterus*.

521. In the second position the heels are towards the right side of the *pelvis*, and the toes to the left, and a little backward. The *trunk* and head are so situated, that the breast and face answer to that part

of the *uterus* which is over the left *sacro-iliac symphysis*, and the back to the anterior and right lateral part of that *viscus*.

522. In the third position, the heels are turned towards the *pubes*, and the toes to the *sacrum*. The child's back is under the anterior part of the *uterus*, and its breast answers to the *lumbar* column of the mother.

523. The fourth position is exactly the reverse of the third: the child's back and heels are towards the posterior part of the *uterus;* while the toes, the face, and breast, are under its anterior part.

Of the Mechanism of Natural Labour, where the Child presents the Feet in the First Position.

524. In this position, as well as in the other three, the feet cannot descend but as they are pushed down by the breech, against which they are placed. They sometimes advance with difficulty, because the legs, crossing one another casually in the *pelvis*, produce considerable obstacles to their descent. When they are without, the breech soon appears at the *vulva*, where it almost always presents diagonally; the left hip, in this first position, answering to the right limb of the arch of the *pubes*, and the right hip to the left *sacro-ischiatic ligament*. The breech continues to advance in that direction, rising a little towards the *mons veneris*, in proportion as the *trunk* disengages; because it is forced to bend a little to one side, to accommodate itself to the curve of the *pelvis*.

525. While things go on thus with respect to the *trunk*, before our eyes, whether in this first po-

sition of the feet, or in the three others, the child's arms are raised towards the lateral regions of the head; following a course which it is easy to form an idea of, if we recollect their natural situation at the sides of the breast.

526. When the armpits arrive at the superior *strait*, the *trunk* would be stopped, and cease to descend, because of the projection of the arms, if the shoulders, though placed according to one of the largest diameters of the *pelvis*, were not as moveable as we find them to be, and could not diminish their breadth; but, by means of these favourable dispositions, they accommodate themselves to the figure of the *pelvis*, and engage in it, by the efforts of the *uterus*, and of the auxiliary powers.

527. The head soon after presents at the same *strait;* and in such a manner that the *occiput* is over the left *acetabulum*, and the face over the right *sacro-iliac symphysis*.

528. The chin, naturally resting on the breast, almost always engages before the *occiput*, so as to be very low by the time the latter reaches the edge of the *strait;* which detaining it a little longer favours the descent of the former.

529. If the head engages diagonally in the superior *strait*, it does not fail soon to change its direction. It has scarcely cleared that *strait*, before it describes a rotatory motion, similar to that mentioned in par. 484; by means of which the forehead turns towards the middle of the *sacrum*, whose curve is better adapted to its round figure, and offers it a larger space. After this motion, the face lies along the *coccyx* and *perinæum;* the nape of the neck being placed against the inferior edge of the *symphsis* of the *pubes*, behind which the *occiput* is in some measure concealed.

530. The chin being then very near the *vulva*, appears at the first or second pain: then follow the mouth, the nose, the forehead, the anterior *fontanelle*, and the *vertex;* all which pass successively before the *fourchette*, or anterior edge of the *perinæum;* while the nape of the neck only turns a little on the inferior edge of the *symphysis* of the *pubes*, as on its axis.

531. In this last period of labour, the action of the abdominal muscles, is almost always subject to the will of the woman, and to the exertion of which she is then so powerfully excited, appears to be all that is necessary for the expulsion of the head; the contractions of the *uterus* assisting very little at that time. This remark ought to induce the woman to bear down with all her strength; and the accoucheur not to pull inconsiderately at the child's *trunk*, to finish the extraction of the head; as is too often done, in the mistaken and dangerous idea, that we cannot deliver the head too soon.

532. Though the child's arms, stopped by the elbows at the brim of the *pelvis*, rise towards the sides of the head; and, in proportion as the *trunk* and shoulders descend, become almost parallel to the neck—those parts are scarcely delivered, and the head advanced into the cavity of the *pelvis*, before the arms disengage of themselves.

533. By carefully observing the progress of the child in this first species of labour, we see with how much wisdom nature has directed all its motions—that the largest diameter of the breech, the shoulders, and the head, may not present parallel to the smallest diameters of the *pelvis;* and that the head, especially, may traverse that canal by offering it only the smallest of its two circumferences.

Of the Mechanism of Natural Labour, where the Child presents the Feet in the Second Position.

534. We cannot recollect the characters of the position of the feet which constitute this species of labour, without remarking the same relation of dimensions between the *fœtus* and the *pelvis* of the mother, as in the preceding position, and without being convinced that the mechanism of the expulsion of the child must be the same in both cases.

535. In fact, the feet descend in this position as in the first; the breech traverses the *pelvis* in a diagonal direction; the shoulders engage in it in the same manner, and their breadth becomes afterwards parallel to the length of the *vulva;* the head presents its greatest extent according to one of the oblique diameters of the superior *strait*, but so that the *occiput* answers to the right *acetabulum*, and the face to the left *sacro-iliac* junction; as soon as the head has cleared the *strait*, the face turns towards the middle of the *sacrum*, and continues to advance along the curve of that bone, the *coccyx* and *perinæum;* while the nape or back of the neck seems to turn to the inferior edge of the *symphysis* of the *pubes*, as on its axis.—See par. 530, and following.

Of the Mechanism of Natural Labour, where the Child presents the Feet in the Third Position.

536. The position of the feet which characterizes this species of labour, has always passed for the most favourable of the four which I have assigned them: and will still appear so to those who

only pay attention to the relation of the diameters of the breast and shoulders of the child to those of the superior *strait;* especially in those women who have the *pelvis* a little contracted from *pubes* to *sacrum:* but we shall think very differently, if we consider the relation of the dimensions of the head to that same *strait.*

537. The feet and trunk of the child may be delivered, in this species of labour, preserving their primitive position with respect to the woman; that is to say, with the back turned directly towards the *pubes.* But it would be an error, when we see those parts descend thus, if we were to imagine that the head continues in the same position; that the face remains exactly underneath; and that the child's forehead passes before the *lumbar* column of the woman. The round form and mobility of the head demonstrate, at least, that it is difficult for it to descend in that manner, and pass over the angle formed by the union of the base of the *sacrum* with the last *lumbar vertebra*, as it descends into the *pelvis.*

538. Although the child's back sometimes disengages directly from under the *pubes*, experience proves that the forehead almost always turns away from the *lumbar* column, and places itself on one side of it; so that the head presents diagonally at the superior *strait*, as in the first or second position, to clear that *strait*, as well as the rest of the *pelvis*, in the manner described in par. 528. and following.

Of the Mechanism of Natural Labour, where the Child presents the Feet in the Fourth Position.

539. The fourth position of the feet is generally regarded as the least favourable; because, the child's face coming upward, it was falsely imagined that the chin must be hitched on the edge of the *pubes*, and so obstruct the progress of the head. If facts have sometimes lent their support to this opinion, they have much oftener demonstrated that the fear of that accident was ill-founded, and that the precautions recommended to prevent it had only served to favour it.

540. It is however certain, that delivery is performed with somewhat more difficulty in this fourth position, than in the three others; because the face does not find the same space to disengage itself from under the *pubes* in the latter period of labour, as it finds towards the *sacrum* in the other cases.

541. When we let nature act without constraint, and do not, under pretence of assisting her perform any manœuvre capable of disturbing her course, the child's *trunk* generally changes its direction as it descends; the breast turns from under the *pubes;* and the breech, as well as the shoulders, engage obliquely in the openings of the *pelvis*, pretty nearly in the same manner as in the first positions of the feet.

542. Independently of these usual changes, the chin generally turns from over the *symphysis* of the *pubes*, before it reaches it; because the *occiput*, on account of its roundness, and the extreme mobility of the head, cannot descend exactly along the middle of the convexity of the *lumbar* column, to stop

and be fixed above the *sacro-vertebral* angle. If it does not place itself constantly on one of the sides of this column, at least it does so almost always; so that the base of the *cranium* presents diagonally at the entrance of the *pelvis*, but so that the face answers to one of the *acetabula*, and the *occiput* to the *sacro-iliac symphysis* on the opposite side.

543. The head having placed itself thus, engages in the *pelvis*, and passes through it according to the same laws as in the three former species of this kind of labour. The forehead engages in the same manner before the *occiput;* but instead of descending backward towards one of the *sacro-iliac symphysis*, and turning afterwards towards the middle of the *sacrum*, it passes down behind one of the *acetabula*, to place itself presently under the arch of the *pubes*.

544. After this rotatory motion, the posterior part of the child's neck rests on the anterior edge of the *perinæum*, or the posterior part of the *vulva;* and that edge then becomes a kind of axis, on which the head turns backward as it disengages from the *pelvis;* in the same manner as it describes a quarter of a circle round the *symphysis* of the *pubes*, in the three former positions, but in a contrary direction. See par. 530.

545. While the child's head describes this quarter of a circle backward, the posterior part of the neck turns more and more towards the *anus* of the woman; and we see the chin, the nose, the forehead, the *bregma*, and *vertex*, disengage successively from under the *pubes*. But the expulsion of the head is performed with more difficulty than in those cases where the face is turned towards the *sacrum;* because the arch of the *pubes* is narrower, in its superior part, than the forehead and *vertex* of the child.

Of the third general Species of Natural Labour, or that in which the Child presents the Knees.

546. If we call to mind the respective dimensions of the *fœtus* and the *pelvis* of the mother, and the mechanism of those labours which make the subject of the preceding article, it will not appear surprising that I reckon here, among natural labours, those where the child presents the knees; because it will be seen that it may be performed by the powers of the mother alone. If in the sequel I consider them otherwise, it is because there frequently occur circumstances which render them preternatural; that is to say, impossible without assistance.

547. The child almost always offers but one knee to the orifice of the *uterus;* the other remaining placed, and as it were butted, against the margin of the *pelvis*, so as to obstruct delivery; or at least to render it very tedious and painful, unless we take care to prevent its difficulties.

548. It is not easy to know the knee by the touch, when it presents singly to the orifice of the *uterus;* because at first the finger can go over only so small an extent of it, that we cannot distinguish it from other parts: but it is not so when the two knees present together. The parallelism of two similar tumours sufficiently denote them in the latter case; so that we are not obliged, as in the former, to have recourse to signs, which are then beyond the reach of the finger, when the membranes are just opened.

549. It is sufficient for the understanding the mechanism of the different species of natural labour, where the child comes presenting the knees, to distinguish four principal positions, as we have done with respect to the feet; because all others we can meet with have a perfect resemblance to those.

550. In the first species, the child's legs, always bent when the knees engage in the *pelvis*, are towards the mother's left side, and the thighs towards the right.

551. In the second, the thighs answer to the left side of the *pelvis*, and the legs to the right.

552. In the third species, the anterior part of the thighs is turned towards the *sacrum* of the mother, and the legs are under the *pubes*.

553. We observe the contrary in the fourth species; the child's thighs being behind the *pubes* of the mother, and the legs placed against the *sacrum*.

554. In each of these cases, the situation of the child with respect to the *uterus* is absolutely the same as in the position of the preceding general species, indicated by the same numerical name. The mechanism of these two kinds of labour is also perfectly similar; for which the preceding article may be consulted.

Of the Fourth general Species of Natural Labour, or that in which the Child presents the Breech.

555. A PRETTY large tumour, in which we discover neither the hardness of the head, nor the softness of the belly, is the first sign of the presence of the breech. A deep furrow, in which we find the *anus* and the parts of generation, puts us out of doubt. The discharge of the *meconium*, as soon as the membranes are opened, may make us presume that the child presents the breech; but we cannot be certain of it without the signs above stated.

556. Though it is almost always difficult to distinguish this part perfectly before the opening of

the membranes, it is almost impossible to mistake it afterwards; and not to discover also its situation with respect to the *pelvis*, with the greatest precision.

557. We might multiply the positions which the child's breech may take at the orifice of the *uterus*, beyond what we have done for the feet and knees; but I shall distinguish only four principal ones, as I have done for them.

Of the Mechanism of Natural Labour, where the Child presents the Breech in the First Position.

558. In this species of labour, the breech presents at the entrance of the *pelvis;* so that the child's back is towards the mother's left side, and a little forward. But, in proportion as it descends, its greatest breadth becomes parallel to the *antero-posterior* diameter of the inferior *strait;** the left hip placing itself a little obliquely under the *pubes*, and the right before the *sacrum*. The right hip at first makes more way than the other, continuing to advance along the slope of the *sacrum*, *coccyx*, and *perinæum;* while the left only turns on the inferior edge of the *symphysis* of the *pubes*, as I have observed before with respect to the *occiput*.—See par. 488.

559. We first see the right hip appear at the *vulva;* and afterwards the breech disengages, rising a little towards the *mons veneris:* and the child's trunk, as it is delivered, bends a little in the same

* That is, the diameter running from the inferior edge of the *Symphysis pubes* to the point of the *coccyx*. W. P. D.

direction. When the breech is sufficiently descended, the feet, which were extended towards the child's breast, disengage of themselves; and the rest of the labour goes on as in the first position of the feet.—See par. 525, and following.

Of the Mechanism of Natural Labour, where the Child presents the Breech in the Second Position.

560. In the second position of the breech, its greatest breadth is also parallel to one of the oblique diameters of the entrance of the *pelvis;* but so that the child's back is towards the right side of the *uterus*, and a little forward. The breech engages by the same mechanism as in the first position, and advances in the same manner; except that the right hip, instead of the left, places itself under the arch of the *pubes*. The left hip being turned toward the *sacrum*, continues to descend along the curve of that bone and the *perinæum*, while the right hip only turns a little under the *symphysis* of the *pubes*. The child's trunk disengages, bending lightly towards the *pubes;* and when the feet are without, every thing goes on as if they had presented in the second position.—See par. 535.

Of the Mechanism of Natural Labour, where the Child presents the Breech in the Third and Fourth Positions.

561. In the third species of labour, where the child presents the breech, it is placed so that the back is upward and the belly downward. It is seldom

that it descends in that position; and more seldom still that the forehead does not afterwards turn away from the projection formed by the base of the *sacrum;* which makes the head present diagonally at the superior *strait*, and place itself as in those labours where the feet present in the first or second position.

562. Things go on nearly in the same manner in the fourth position of the breech, where the child's belly is upwards, and the back towards the posterior part of the *uterus*. If its breadth, from one hip to the other, is at first placed transversely, with respect to the superior *strait*, it becomes insensibly parallel to one of its oblique diameters, and afterwards to the largest diameter of the inferior *strait;* so that the length of the head presents in the same manner to both: but with this difference, however, that the *occiput* is underneath, and the face answers to one of the *acetabula;* whereas in the former positions the face is underneath, and the *occiput* towards one of the *acetabula*.

Of the Management of the Woman during Labour.

563. The greater part of women, if left entirely to themselves during labour, would nevertheless be delivered without help: this truth, founded in nature, has no need of new proofs. But those same women, if assisted seasonably, would they not be delivered with more ease and safety? That is what I shall now proceed to investigate.

564. Among those labours which are terminated without help, some take place so precipitately, that the great and sudden depletion of the *uterus* sometimes becomes the source of several mortal acci-

dents, or at least extremely dangerous; and others are so tedious and laborious, that their consequences are not less dreadful: whence we see that it may be as salutary to check the progress of the former, as to accelerate that of the latter.

365. Though nature would, sooner or later, surmount some of the obstacles to delivery, there are many others under which the woman would infallibly sink, if we were not to come to her assistance.

566. The accoucheur ought then, in none of these cases, to content himself with being a mere spectator. That patience, which is recommended by some as his principal virtue, ought to have its limits; an excess of confidence in the secret resources of nature, which some people boast of with a sort of assurance, being not less condemnable than the inconsiderate manœuvres of those ignorant men, in whom rashness supplies the place of knowledge.

Of the Treatment which the State of Women generally requires in the First Period of Labour.

567. Women, almost always uncertain concerning the period of their pregnancy, often mistake for the beginning of labour, pains which are very foreign to it; but whose progress is sometimes such, that women who have had several children, may be deceived by them.

568. The accoucheur, after having observed the effect of these pains a little while, ought to endeavour to distinguish their true character, and discover their cause; in order to favour the true labour pains, or administer proper remedies for those which are foreign to it, lest they should bring it on prematurely, as frequently happens.

569. Touching alone can enable us to distinguish these two species of pains with certainty; for they are sometimes extremely similar in their manner of attack, and their progress; but always very different in their causes.

570. A hardness of the uterine globe, a stiffness of the edge of its orifice, and a distension of the membranes during the pain, as well as a slackness and relaxation of all those parts in proportion as it goes off, invariably characterize the pains of labour; because, like them, those symptoms are inseparable from a contraction of the *uterus*.

571. The effects of false pains are on the contrary very various, both on account of the diversity of their causes, their complication, and the parts which are the seat of them. Sometimes these pains are caused by a plethora, either universal or partial; sometimes by indigested or putrid matter in the first passages, by a stone in the kidneys, ureters, or in the bladder; and sometimes from several of these causes together. We never observe any of the effects mentioned in the preceding paragraph, during the action of these false pains, at least unless they have excited contractions of the *uterus*, and true labour pains.

572. After having perfectly recognised the character of the true pains, whose frequent return, and augmentation, constitute what is usually called labour; the accoucheur must endeavour to discover whether the woman be at her full time or not; that he may not forward an accidental labour, which he might have put off, if he had sought its true cause. In order to which, he must recal to mind the characteristic signs of the different periods of pregnancy. —See the article on touching.

573. When these pains are not felt till the time of the perfect maturity of the *fœtus*, we must attend to their frequency and intensity; to the size of the orifice of the *uterus*, and to the hardness of its edge; in order to estimate nearly what will be the duration of the labour, and the time when it will terminate. We must not forget, in order to form a just prognostic, that the first labour is in general longer than others, and that the dilatation of the orifice of the *uterus* is never slower than at the beginning of labour.—See par. 439.

574. We ought also to inform ourselves, by touching, whether the *pelvis* be well formed or not, especially in a first labour; and how the orifice of the *uterus* is situated, and whether the *fundus* is oblique, as well as what part of the child presents, and its position; in order to prescribe early that situation which is best adapted to the state of the woman.

575. All women should not be treated in the same manner during the course of labour, because the circumstances of it may be different; what is useful to some, may be pernicious to others. We ought not, for example, to give any thing but broth to those whose labour is strong, or ready to terminate, if they stand in need of any aliment; but we may allow more solid nourishment to those whose labour is but beginning, especially if it be not likely to terminate soon, in order to support their strength.

576. We ought not to be less cautious concerning the drink we allow to a woman in labour, than about the nature of her aliment. All heating things, such as wine, mulled with spices, or spirituous liquors, so much in use among the common people, are to be avoided, except by some few, who may

have need of a cordial. The most convenient drinks are barley-water, gruel, weak lemonade, or any other diluting liquor. Many women prefer wine and water; but it is apt to produce acidities, and often provokes vomiting, to which there is already but too much disposition, especially when it is drunk hot.

577. Glysters should not be neglected: one is sufficient to evacuate the gross excrement which might add something to the natural difficulties of labour; but it will be necessary to repeat them when the labour is tedious, when the pains are felt towards the loins, and when there is any heat in the bowels. A decoction of some emollient plant, or of linseed, is preferable to plain water.

578. Bleeding at the arm is not less useful in many cases. By diminishing the plethora in some women, it augments the force and energy of the contractions of the *uterus*, while it mollifies and relaxes the soft parts which form the passage. It is particularly salutary to those women who complain of pains in the head, and a sensation of heaviness in the limbs; to those who have the eyes red, the face inflamed, the superficial vessels puffed up; or who are threatened with convulsions, hæmorrhage, inflammation of the *uterus*, &c.

579. Baths, demi-baths, emollient fomentations, and moist fumigations, may be employed with success. These means are never more useful than when time has taken from the parts concerned in delivery, the natural suppleness of youth, so necessary for a facility in this operation. But we must by no means have recourse to them, and especially to the warm bath, when a sanguine plethora predominates, till we have first diminished it by one or two bleedings. For so much as they are

beneficial in some circumstances, so much they become pernicious in this latter, whether to the mother, or to the child.

Of the Situation of the Woman during Labour.

580. The situation of the woman is not always arbitrary: it must be varied according to circumstances, and the period of labour. When it is but just begun, and is not complicated with any accident, and every thing relative to delivery is in good order, the woman may choose the situation which appears most convenient to herself.

581. Women threatened with a descent of the *uterus*, or an hæmorrhage; those who are very weak, or in whom the *uterus* is situated obliquely, ought to lie down from the beginning of labour to the end. In cases of great forward obliquity, they must be laid on the back; in lateral obliquities, on one side, but on that which is opposite to the deviation, in order to bring the axis of the *uterus* nearly parallel to that of the *pelvis*.

582. Although the situation in which women are usually placed, in the last period of labour, is often not less important than that at the beginning, yet it is not the same in all nations. Reason, and convenience to the women, are almost always less consulted than custom. In some countries, as in Flanders, Holland, Spain, &c. the women have chairs made on purpose. Almost all over England, they place themselves on a bed, and lie on their side, with the breech turned towards the accoucheur; the legs and thighs being half bent, and their knees separated by a pillow.

583. In some of our provinces the women are delivered kneeling on a cushion, with the elbows resting on a chair: in others they keep themselves standing, or sit on the knees of some person who supports them. But of all these positions, none is more convenient than that adopted among us. *Roëderer* confesses that the best chairs are much less convenient than the little bed used in France.* This bed is constructed in the following manner:

If we have not the common bedstead of the breadth of from two feet and an half to three feet at most, and covered with its straw mattress, we take a *lit de sangles*,* on which we smoothly lay one or two mattresses. Under the middle of them we put a cushion of hair, or straw, to keep them from sinking, and to support the woman's loins. This bed is to be furnished with pillows and sheets, and blankets according to the season.

584. But it is better to double the uppermost mattress, so that it may cover but one half of the length of the bedstead, than to spread it over the whole: as the woman may then be placed on it much more commodiously for delivery. In the former case they are laid flat, with the breech often sunk into the bed, notwithstanding the precaution of the cushion; so that the *perinæum* and *vulva* are hid. In the latter, the lower part of the *trunk* being placed on the end of the folded mattress, all those

* *Roëderer* practised midwifery in a nation where the chair was very much in fashion.

* *Lit de Sangles* is a little bedstead without any transverse pieces at the ends; the feet of which cross each other at their centres, and are pinned together; so that, when the bed is off, the sides of the bedstead may be brought close to each other, and the feet are then almost parallel. It is a kind of bedstead in frequent use among the poorer people and servants in Paris.

parts are entirely free, and are much more easily developed: the woman is not obliged, as in the former case, to raise the breech, resting on the heels and shoulders, at every pain, till the child be expelled.

585. It is customary to place a cross board at the foot of this bed, to sustain the woman's feet in time of a pain, and favour her efforts: but this precaution is useless, as we always find more hands than we want, to give the woman every necessary support.*

Of preparing the Parts of the woman for Delivery.

586. Most midwives are still in the pernicious habit of placing the woman on the bed as soon as the pains are a little frequent and strong, in order to begin betimes what they call the *preparation;* or, to speak more intelligibly, the dilatation of the parts. This they often do without knowing whether the woman be in labour or not, and sometimes even

* The mode usually pursued here, is to have the patient's bed made in the common way, with the addition of a folded blanket in the middle of it, and under the lower sheet; then we separate the sheets by rolling the bed clothes from one side nearly to the other. The foot of the bed is then well beaten to make it firm, over which part another folded blanket is spread; the patient is then for the most part placed on her left side, her knees a little bent, her hips placed near the edge of the bed, while her feet are firmly pressed against the bed post. A pillow rolled tight and tied, in the advanced period of labour is placed between her knees; a sheet or blanket according to the weather is thrown over her; her head is raised by pillows. The advantage arising from this mode is, that when the labour is finished, the patient after having the wet things taken from about her, is easily drawn up in the bed, without fatigue or even disturbance. W. P. D.

without being sure that she is with child; which indeed I should scarcely believe, if I had not been several times a witness of it.

587. These manœuvres, which they entitle preparatory dilatations, often produce an effect quite contrary to what they expect from them: for by depriving the parts which they handle so incautiously, of the *mucus* which nature furnishes at that time abundantly, for no other purpose than to relax them, they irritate and dry them so much, that they seldom fail to inflame and become extremely painful.

588. It is sometimes necessary to prepare these parts for delivery, and even to begin those preparations during the latter periods of pregnancy; but then we must proceed in a very different manner. Warm baths, or demi-baths, emollient vapours, and the repeated application of fat or mucilaginous substances, may be advantageously employed. Emollient injections, such as the mucilage of marsh mallows, or of linseed, would not be less useful; but there is something so disgusting in them, that few women will submit to their use, except in accidental circumstances which are more severe than those that accompany a labour which is merely long and laborious.

Of quickening Lingering Pains.

589. Nothing is less regular than the progress of labour pains: sometimes they augment suddenly; sometimes they diminish, slacken, and even go entirely off for a time; which may depend on a variety of causes, each of which presents a particular indication.

590. Many persons, without regard to those different indications, always prescribe irritating remedies, in order to quicken the pains. Some give decoction of senna in glysters, others in draughts; and *Mauriceau* added to this beverage the juice of a sour orange. Others again prescribe ipecacuanha, to excite vomiting; and some to keep the woman standing or walking about, which is quite as imprudent: for there is as much ignorance in dragging the woman thus about the chamber, when she is worn out with fatigue, as in tormenting her with active medicines. Time is almost always the best remedy in these cases.

591. When the tardiness of labour proceeds only from the weakness or exhaustment of the woman, rest, good restoratives, a little wine, or other things of that kind, will be found most beneficial. On the contrary, when it depends on a stiffness of the fibres of the *uterus*, or an *engorgement*, or inflammation of that *viscus*, bleeding, warm baths, emollient fomentations, and diluting drinks, are the only things capable of quickening the pains. But if the slowness of the labour is only the effect of the premature or continual draining off of the waters, as has been already mentioned, we must wait till they be completely evacuated; or else accelerate their issue by tearing the membranes anew in a more favourable part, and raising the child's head a little with the end of the finger; which may be easily done, and without the smallest inconvenience, notwithstanding the fears which some have endeavoured to excite concerning the consequences of this procedure.

592. Though the premature opening of the membranes often renders labour more tedious, and in some respects more laborious; the same inconveniences sometimes also arise from their not opening in proper time: whence we see that it would not be less useful to open them in the latter case, than to keep them whole in the former, if we could.

593. Except in cases of flooding, or convulsions,* we ought never to open the membranes before the orifice of the *uterus* be entirely prepared for delivery; that is to say, till it be larger than a crown piece, and its edge so soft and thin, that it may be easily extended farther. The labour ought moreover to be in its full force; which supposes the pains to be strong and frequent.

594. The manner of opening the membranes is in general very simple. We advance the end of the finger to the middle of the orifice of the *uterus*, and wait till the membranes are forced through it, and become very tense, which can only be during a pain; by pushing the finger then, it passes through them. If we do not succeed the first time, we must wait for another pain, and try again.

595. This method does not always succeed: either because the membranes are of a very strong or of a very loose texture; or because their thickest and most cellular part is nearest the finger; or because the child's head is already so engaged, that the waters cannot pass under it, to distend the bag sufficiently.

596. When the membranes present their thickest part at the orifice of the *uterus*, or are so strong that

* See par. 794 and 813.

we cannot tear them by the method recommended above, we must begin by weakening them in one point, by scratching them with the end of the nail; and afterwards we may succeed more easily. If this also fail, we may open them with the point of a pair of common scissars, which may be introduced covered with a little ball of wax, if necessary, in order to conduct them more safely. I must remark that this case is exceedingly rare; and still more rare, when it does happen, for the pouch formed by the membranes not to be near enough to the *vulva* to be seen, and consequently opened without fear: so that we may dispense with the aforesaid precaution.

597. When the pouch remains very slack during the pain, either because the membranes are of a very soft and loose texture, or because the head, being very low, hinders the waters from descending sufficiently to fill and distend it, it must be torn by pincing the membranes, between the ends of two fingers.

598. Whether we use the finger only in opening the pouch, by scratching the membranes to weaken them, or otherwise; or whether we use scissars, or any other instrument; we ought to take great care not to act upon the child's head, by mistaking a tumour of the hairy scalp, which frequently rises in laborious cases, for the pouch in question. We must, with the same care, avoid applying an instrument, or the nail, to the *uterus*, which sometimes still covers the head, though it is very low in the *pelvis*. It is so much the more easy for persons not exceedingly skilful to be deceived in this latter case, because the orifice of the *uterus* is concealed backward; and that portion of it which covers the child's head, becomes at length, and especially during the pain, as smooth and as tense as the membranes.—See par. 249. and the observations relating to it.

Of what is necessary to be done after the Membranes are open.

599. The woman can never be examined by touching more seasonably than immediately after the opening of the membranes; whether to certify ourselves concerning the position of the child, if we have not been able to discover it before; or to observe whether the head engages in a favourable manner, or not: in order to let nature act, or prevent her being exposed to fruitless efforts, according to circumstances.

600. As it is necessary to excite some women to bear down with all their strength, to accelerate their delivery; so it is not less advantageous to engage those who are subject to a descent of the *uterus*, an *hernia*, spitting of blood, &c. to moderate those same efforts.

601. To hinder the descent of the *uterus*, when there is any reason to fear it, it is not sufficient merely to engage the woman not to bear down: the accoucheur must likewise support the edge of the orifice of the *uterus* during each pain, that it may not be pushed out by the child's head; which is apt to happen when the edge is rigid. We must likewise be careful not to suffer it to be dragged along by the shoulders, in delivering the *trunk*.

602. When there is an hernial tumour, we must endeavour to reduce it; and prevent its return by a convenient pressure, either with the ends of the fingers, or a suitable compress. It were to be wished that we could exert a like pressure when the hernia cannot be reduced, to prevent a new portion of intestine from insinuating itself into the tumour, and endangering a strangulation: as I saw in a woman

who had had a large *epiplomphalocele* nine years, and who for two days had in vain exerted the most violent efforts for delivery.

603. When the woman is much troubled with pains in the small of the back, a folded napkin may be passed under the loins, with which two assistants may raise her up, and support that part during each pain. This precaution, besides that it diminishes the intensity of those pains, is often necessary in the last moments of labour, to favour the exit of the child. Indeed it can hardly be dispensed with in those women who are laid flat, who have the breech sunk and hid in the bed, and who want strength or courage to raise it up during the last pains, by supporting themselves on the heels and shoulders.

604. When the woman is attacked by the cramp in the legs and thighs, which is often less supportable than the most violent labour pains, we must endeavour to relieve her, either by dry frictions on the part affected, or otherwise, according to circumstances; and by changing the direction of the child's head a little with respect to the *sacral* nerves, which it always compresses more on one side than the other.

605. When the child's head begins to press against the external parts, it is sometimes proper to prepare them, that they may not be injured in the last moments. Besides fat substances, such as lard, &c. which we are to apply often, we may introduce two fingers into the *vagina*, to enlarge it by degrees, as well as the *vulva*, either by separating the fingers in different directions successively, or by pressing downward against the *perinæum*. But this is only to be done in the interval of the pains; contenting ourselves, during their action, with supporting the *perinæum* with the palm of the hand, in order to prevent

its tearing, and hinder the head from being delivered too suddenly.

606. These preparations are never more necessary than in a first labour. If they are omitted then, we are commonly freed from the necessity of using them afterwards; because the *perinæum* being torn, never unites perfectly, nor do the other parts ever recover their natural tone.

607. When the posterior extremity of the head is engaged in the *vulva*, as in a kind of crown, if the *fourchette* is not too much distended, we may permit the woman to indulge her inclination to bear down; and during that time, without however discontinuing to support the *perinæum*, we may favour the exit of the head, by pressing against it underneath, and near the *anus* of the woman, as it were to oblige it to ascend towards the *mons veneris*.

608. The head being almost delivered, we finish its disengagement by raising it more and more towards the *pubes;* or by insinuating one of the fore fingers under one of the sides of the lower jaw. We then turn the face towards one of the woman's thighs, but observing that it be towards that to which it tends of itself. Afterwards we examine the situation of the shoulders with respect to the inferior *strait:* and push one of them towards the *sacrum*, and bring the other under the *pubes*, if they are not placed so naturally. We then deliver them, as well as the rest of the body, by pulling gently and cautiously at the head; while the mother, on her side, does what she can to expel it.

609. We must never attempt to pull with any considerable force at the head and neck of the child, with a view to extract the *trunk*, when the breadth of the shoulders obstructs it progress; for nothing can be more dangerons than such efforts. In that

case, we must introduce the fore finger of each hand into the *axillæ*, in order to pull with them, after the manner of hooks; and, if that be not sufficient, we apply *lacs*, or the blunt hooks which terminate the handles of the French forceps, or some other similar instrument: but these cases are so extraordinary, that an accoucheur in great practice, and properly skilled, would not perhaps meet with it four times in his life.

610. When the shoulders do not come along easily, we must always begin by making them take the situation above mentioned; for even the smallest cannot be delivered transversely without extreme difficulty; as is very easy to comprehend.

Particular Precautions relative to each Position of the Head, or to other Circumstances which sometimes render Natural Labour a little more difficult.

611. Circumstances, which would be too long to detail here, may add to the natural difficulties of labour, by obstructing more or less the pivot-like motion, by which the *occiput* or forehead place themselves opposite to the arch of the *pubes*, when the head has engaged diagonally in the cavity of the *pelvis*. We may then prevent some difficulties to the woman, by seasonably favouring this rotatory motion; and may often shorten the work of nature considerably, supposing her able to accomplish it.

612. When the head presents in the third position, which is not very frequent, if the brim of the *pelvis* is a little narrow from *pubis* to *sacrum*, we ought to advance the hand, or some of the fingers only, to the entrance of the *uterus*, to turn away the

occiput from over the *symphysis* of the *pubes*, and direct it towards one of the *acetabula:* which is generally pretty easily executed at the time of the opening of the membranes. This precaution may spare the woman the pains of a much longer labour than when the head presents in the first or second position; and which, after all, might sometimes be fruitless.

613. In the fourth and fifth positions of the head, we ought also to endeavour to bring the *occiput* towards one of the *acetabula;* that it may afterwards turn under the arch of the *pubes*, instead of going towards the curve of the *sacrum*. By thus directing the back of the head, in proportion as it engages in either of these positions, we often not only favour the efforts of nature, which tend to make it take that course; but sometimes also we, as it were, prescribe laws to her: and the facility of the delivery is the work of art.

614. It were to be wished that we could in the same manner change the sixth position of the head, and reduce it to one of the two first; but we must not hope to accomplish that, even if we pass the hand into the *uterus* at the instant of opening the membranes; on account of the difficulty of making the child's body turn in the same direction as the head: still less can we do it when the waters have been a long time evacuated, and the head is already in the cavity of the *pelvis:* we could not at this time carry the face downward, but by making it pass round half the circumference of the *pelvis;* and that motion, which would be entirely at the expense of the neck, the *trunk* being fixed, and closely embraced by the *uterus*, would be of the most dangerous consequence to the child.

615. In the best positions, as well as in the others, the head sometimes engages in such a manner, that

the forehead descends more than the *occiput*, so that the head presents the whole length of its greatest diameter to the inferior *strait;* which generally produces insurmountable obstacles to its exit. It is easy to prevent these obstacles, by changing the situation of the *uterus* betimes, and by supporting the fore part of the head a little, to oblige the *occiput* to descend. I shall treat more amply in the sequel of what must be done in this circumstance. See par. 950. to par. 956. inclusively.

616. It is very common to see a child come with the umbilical cord twisted round its neck; and this disposition, though it does not produce those obstacles to the exit of the head, which have been commonly attributed to it, yet requires some precautions on the part of the accoucheur: but they do not become necessary till the head is without; that, in disengaging the *trunk*, the *umbilicus*, already stretched, may not be torn, nor the *placenta* dragged along at the same time.

617. Some authors have recommended, in order to avoid tearing the *umbilicus*, as well as to facilitate the delivery of the *trunk*, and hinder the *placenta* from being dragged along with it, to untwist the cord, by making it pass as many times over the head as there are turns on the neck; or else to keep the head on one side against the *vulva*, and deliver the *trunk* by bending it as it comes along. But if we find any difficulty in obeying these precepts, we must cut the cord, and especially when the child's face is swelled, or livid, in order to prevent the effects of a longer strangulation.

618. I shall in the sequel detail the particular indications presented by the other species of natural labour; as well as the various circumstances which, by complicating them, often render them preternatural.

Of the Management of the new-born Child.

619. The child must be treated differently, according to its state and condition at the time of birth.

Of the usual Method of treating a new-born healthy Child.

620. As soon as the child is born we lay it transversely, between its mother's legs, and so near to her that the cord may not be stretched; and then turn it on one of its sides, that the blood and waters which drain from the *uterus* may not fall into its mouth.

621. Some accoucheurs are accustomed to leave the child in that state several minutes, and even longer, without meddling with the cord; only taking care to lift up the coverings a little, that it may breathe: while many others scarcely give themselves time to tie and cut the cord, before they remove it from its mother.

622. In fact, we ought to leave it as short a time as possible under the clothes; because there it can only respire a moist and impure air, always too much rarefied, and often infected with animal vapours which rise from excrements and urine which the woman discharges involuntarily in the last moments of labour; very different from that pure and temperate air, which its delicate organs require.

623. A ligature made about two inches from the *umbilicus* is all that is necessary; two have been employed, but the second is useless, nay even hurtful

sometimes, as it prevents an important depletion from the *placenta*. This ligature ought never to be applied until the pulsation has completely ceased in the cord. The best ligature we can use, is a part of a skein of fine thread; and passing it once round the cord and tying, is sufficient.

Of the Treatment of a Child born in a Morbid State.

624. Some children are born in a state of apoplexy; others in a state of *asphixy*, or apparently dead; and some come so weak, that we scarcely dare flatter ourselves we shall be able to revive them.

625. The section of the cord, on account of the depletion it procures, is the most efficacious assistance we can give to those born in a state of apoplexy; and it would not be less dangerous, to those children, to leave the cord whole than to tie it.

626. The vital powers are sometimes so weakened in these cases, that it is with difficulty we obtain a few drops of blood, by the section of the umbilical cord; which cannot be sufficient to save the life of the child. We must then endeavour to procure a greater discharge by pressing the belly gently, and alternately. We often cannot obtain the discharge necessary to unload the vessels of the brain, and make the tumefaction and lividity of the face disappear, without plunging the child up to the armpits into a bath more than warm, and rendered stimulant by the addition of some spirituous liquor, as wine, brandy, or even vinegar.

627. By this means we awaken the irritability of the heart, ready to be extinguished, excite its contractions, and quicken them so far, that we soon see

its pulsations reappear, those of the arteries of the cord, and of the *carotids*, though they had ceased for some minutes; and the blood which fell by drops from the umbilical arteries, presently flows by starts, and to a considerable distance. I have observed all these effects in children who were born in a state of the most complete *asphixy*, and had been already abandoned as dead, after a few fruitless attempts. One of these children gave but very uncertain signs of life half an hour after its birth, and did not shew any positive ones till more than half an hour; for we cannot regard as such, the oscillations excited by the heat and activity of the bath.

628. Having brought these children into a free and temperate air, whether we keep them in the bath I have just prescribed, or not, as may be thought proper, their mouths must be cleansed from the slime which often fills them;* and then we procure them a kind of artificial respiration, by blowing repeatedly into their mouths while we close the nostrils with the finger and thumb, and as often pressing their breasts, but very cautiously. We may also irritate the membrane of the nose with a feather, or bring a little volatile alkali near it; or rub the regions of the temples, spine, and heart, with cloths dipped in some spirituous liquor.

629. These latter means must be used still more

* Many children may be saved I am convinced from experience by a proper attention to this circumstance: the best mode of freeing them from the *mucus*, &c. which obstructs the passage of air to the lungs, is to suspend them by the heels with the mouth downwards; a great quantity by this means is sometimes discharged. It however is occasionally too tenacious to flow out in this way; when this is the case we pass a piece of fine dry rag over one of our fingers, and introduce it to the back part of the mouth; the *mucus* adheres to the rag and is withdrawn with it. W. P. D.

liberally to children born pale and discoloured, with the limbs flaccid, and who appear to be in that middle state between life and death, known by the name of *asphixy*, than to those in an apoplexy.

630. Dry frictions with hot cloths, on the whole length of the spine, and blowing the smoke of paper into the *anus*, must not be neglected. Brushing the soles of the feet, the palms of the hands, and the back, swiftly, but lightly, with a flesh brush, is perhaps the most efficacious means of awakening the principle of life in this sort of children. We may advantageously pour one or two drops of volatile alkali, mixed with a tea-spoonful of water, into their mouths. If that cannot be got, we may put a bruised onion or garlick under their nose. Some children, to whom these means had been administered too sparingly, or who perhaps had been deprived of them because they were thought dead, have been taken alive several hours afterwards from under the clothes, where they had been already, as it were, buried; which makes it probable that many others might have been saved, had the proper means been diligently used.

631. It is generally thought necessary to keep children, born so weak as to give little hope of living, some time close to the mother, and without cutting the umbilical cord. This precaution is not only useless, but may be hurtful to the child. The circulation of the blood from the vessels of the *uterus*, into those of the *placenta*, and *vice versa*, no longer going on, and that in the cord being almost extinguished, the child cannot be revivified by the mother, as some have thought. She can communicate but very little heat to it, which may be much more easily and certainly procured another way: the child, by this pretended help, is deprived

of that which would be more real and efficacious, and which cannot be administered till it be removed from the mother.

632. As soon as the pulsation ceases in the cord, it ought to be cut: the ligature is that instant useless, because there is no blood flows. After taking the child from under the clothes, it must be kept warm, and treated as directed in par. 626, and following. We may also bathe it in warm water, mixed with wine; but it must never be plunged into brandy alone, or into strong wines, &c. I have seen children who have narrowly escaped being victims to the credulity of their parents concerning the virtues of these baths: some have been threatened with convulsions, and others have been taken out with the face tumefied and livid, and as in a state of apoplexy.

633. After natural labours which have been difficult and very long, whether on account of the narrowness of the *straits* of the *pelvis*, or the resistance of the soft parts, children are born with a tumour more or less voluminous, and commonly pretty soft, on the top of the head and a little backward; the *cranium* itself is lengthened, or undergoes other changes which make it appear deformed; sometimes also the bones are depressed in certain places, or even fractured, and the fragments sunk in on the brain.

634. When the tumour of the hairy scalp is merely œdematous, it dissipates easily in a short time: it is sufficient to foment it with wine, with salt and water, or any vulnerary infusion. This tumour is more difficultly resolved when it is sanguine; and especially when the blood is extravasated under the *pericranium*, or under the teguments, and is there coagulated, as I have often seen:

we are sometimes obliged to open this species of tumour.* If the consequences of it are simple when the blood is only extravasated under the teguments, it is not so when these tumours are seated on the *cranium* itself, and the bones are found bare after the incision; which is the most usual case.

635. The people imagine that the accoucheur ought to press and mould the child's head, to restore it its natural form, which it seems to have lost in delivery; and many matrons are still of the same opinion. Though such pressure, methodically made, is no way dangerous to the child, yet I think it is better to proscribe it entirely; for the head soon recovers its natural form of itself. It is only when there is a fracture, with depression, that we need pay any attention to it; but then it is much less on account of the deformity of the head, than of the accidents which depend on the fracture and depression of the bones. This case requires the aid of a skilful surgeon, and not of a midwife.

636. After a preternatural and laborious labour, the accoucheur has sometimes a fracture or luxation to reduce; because he cannot always, notwithstanding the most exact precautions, free the child from those accidents: he ought therefore to examine it well before he leaves it to the nurse.

* This I conceive can never be necessary, unless suppuration has been added to extravasation, as all the instances which I have seen, and they are not few, the effused fluids have been sooner or later taken up by the absorbents; and in a case where I ventured to open one of these tumours, I had a troublesome sore to deal with for months. W. P. D.

Sequel of the Treatment of Healthy Children.

637. After having attended to the pressing indications respecting the mother, having delivered the afterbirth, and put her into a condition to pass a few seconds on the couch, the accoucheur must again attend to the child. He ought to preside at the dressing, in order to forbid every thing that may be hurtful; and should prescribe the method of managing the child in the first periods.

638. Almost all children are covered with a greasy viscous slime, which must be removed, not only for the sake of cleanliness, but also to facilitate the transpiration, which it greatly obstructs.* It must be carefully cleansed from the armpits, the folds of the groins, and the parts of generation in girls, where this slime is more abundant, and more apt to corrupt, and produce excoriations.

639. In order to cleanse the skin easily, and free it from this glutinous slime, we must begin by moistening it with a little oil or butter, to render it more fluid and less viscous; afterwards it may be wiped off lightly with soft linen. If we do not first moisten it thus, being obliged to rub harder, we irritate and inflame the skin, so that it becomes, as it were, erysipelatous in those places. The child is afterwards to be washed with warm water, and a little wine; or it may be bathed, if thought proper; but we ought never, at this early period, to plunge it into cold water, because the effects of it might be very disagreeable.

* This substance has been analysed by *Vauquelin* and *Buniva* and found most to resemble fat; they have not discovered any thing which readily unites with it. W. P. D.

Of the Manner of dressing Newborn Children.

640. Every nation has a different method of clothing and dressing a newborn child; but there cannot be any thing contrived more contrary to the intentions of nature, than the dress so long since adopted among us, and unhappily too much known in most of our provinces.

641. Of all the parts which compose this dress, none appears more necessary than the little bandage which is put round the child's belly; whether to support the end of the cord till it fall off, or prevent an umbilical *hernia*, till the ring be sufficiently contracted to oppose it by itself.

642. At first this bandage must be made of three compresses; that is to say, two of a few inches square, and another long enough to go round the body. In the middle of one of the former we make a hole large enough to receive the cord, and slit it downward from that hole, so that it may have two ends. We anoint this compress, near the hole, on both sides, with a little butter, that it may not stick to the *umbilicus*, nor to the cord; and that we may change it, when needful, without pulling and tearing the vessels, before the time of their perfect obliteration. This compress being placed on the belly, we pass the cord into the notch, turning it upward and towards the left side, and then cross the two ends underneath; so that the skin of the belly, which advances on the cord, may not appear, nor the *umbilicus* be stretched. We place the second compress over the first; and secure all with the third, with which we make a circular round the body, moderately tight.

643. Although the cord falls of by the fourth or fifth day, and the *umbilicus* is usually cicatrised by the eighth at farthest, it is very useful to continue this little bandage a few weeks longer. But the first compress may be made a little smaller and thicker, in order that the pressure may be made more exactly on the umbilical ring, and the proposed views be accomplished: but it must no longer be opened in the middle as at first.

644. The child ought to be dressed as simply as possible, and wrapped up no more than the season and cleanliness require. The head ought to be covered only with a biggin and cap; the breast and arms with a little shirt, and waist-coat; the rest of the body, from the arm-pits to the feet, first with a linen cloth, and then with one of cotton or woollen, the surplus of which may be turned up before, and the whole secured with pins and not with bands.

645. The choice of air proper for a newborn child is not less important than that of its aliments, and other things which surround it. Its chamber ought to be in an airy situation, and not too close, that the air may preserve the necessary salubrity. It ought also to be as far as possible from noise, that the child may sleep quietly, and not be awaked with a start. It is not less essential that it should be laid opposite the light; which is the most effectual way to preserve it from squinting.

646. The child may do without nourishment the first day; but it is not proper to continue that severe regimen longer. In the mean time, it may be made to swallow from time to time a few spoonfuls of water, sweetened with sugar or honey, in order to dilute the *meconium*, and favour its evacuation.

647. No aliment is fitter for a child than its mother's milk. Though the breasts do not swell

till the second or third day after delivery, we ought not thence to conclude that the milk does not begin to secrete in them before that epoch, or that the child has no need of nourishment till then; as many have unfortunately imagined. The mother ought to give it the nipple as soon as possible; but a nurse should not do it till later.

648. It is not more advantageous to habituate a child to suck only at certain hours of the day, than to give it the breast every time it wakes or cries. It ought to be suckled when it is hungry; a little attention will enable the nurse to distinguish the cries excited by that sensation, from those caused by pain or other uneasiness.

Of delivering the Afterbirth, and the Regimen to be observed in the Month.

649. Delivering the *afterbirth*, and the regimen to be observed by lying-in women, form two articles not less essential than the preceding: the least fault in one, or the smallest inexactitude in the other, may equally become the source of a crowd of ills and disagreeable accidents.

Of Deliverance.

650. By the word *deliverance* has long been understood the exit of the *placenta*, and the membranes. It would almost always be the work of nature, if we were to give her time to perform it; and it must be confessed that in most cases we con-

tribute very little to it, though the people imagine the contrary, and regard our ministry in this article as the sheet-anchor of the woman.

651. The powers of nature are however limited; and in delivering the *afterbirth*, as well as the child, art is sometimes absolutely necessary.

652. Two very opposite opinions have been built on these fundamental truths. Some have pretended that we ought always to commit the expulsion of the *placenta* to nature; and others, that we cannot extract it too speedily: the latter scarcely gave themselves time to tie and cut the cord, before they introduced the hand into the *uterus* to finish the delivery; while the former patiently waited the expulsion of the *afterbirth*, though in some cases nature alone could not perform it.

653. These precepts, too general on both sides, have often been fatal to the woman. There are cases, without doubt, and I shall distinguish them carefully, where the accoucheur is obliged to deliver the *placenta* instantly; and others where circumstances require that he should abandon it almost entirely to nature: but, in all, he may cooperate usefully, by seizing the favourable moment for it.

Of the unassisted Delivery of the Placenta.

654. The deliverance which is performed without help comprehends two periods, that of the detachment of the *placenta*, and that of its expulsion. The *uterus* is the principal agent of this double operation; its action alone forces the *placenta* to

detach itself; but standing in need of help to disencumber itself entirely of it, the contraction of the abdominal muscles comes to its assistance.

655. The repeated efforts of the *uterus* to expel the *fœtus*, usually destroy the adhesions of the *placenta*, since we almost always find it at the orifice, immediately after the exit of the child.

656. As the orifice of the *uterus* generally closes, as soon as the child has passed it, the *placenta* is shut up for a few minutes: but that *viscus*, still very much irritated, not being able to bear this now foreign body, presently contracts to expel it, and forces its orifice to reopen to give it a passage; the woman also, stimulated by the uneasiness caused by the *placenta* engaged in the *vagina*, soon makes some efforts to accelerate her *deliverance*.

657. The *placenta* always brings the membranes away with it, unless their union with the *uterus* be very strict. In that case they tear, and the portion retained does not separate till some time afterwards, when it comes away with the lochia: but the *uterus* does not always support its presence till that time, without accidents.

658. Nature always follows this course in delivering the *placenta*, but not always with an equal pace; some women expelling it very quickly, and others very slowly. The delivery of the *placenta* is in general so much the quicker, as the expulsion of the child has been slower, as the *uterus* is more irritable, and as it preserves more force and less capacity immediately after the delivery of the child; and *vice versa*.

Of the Signs which indicate the Time when we ought to cooperate in delivering the Placenta, and the Method of doing it in the most usual Cases.

659. We ought never, in the natural order, to attempt delivering the *placenta*, till it be detached, and the *uterus* endeavours to expel it. A return of the pains announces that instant; the hardness and small size of the uterine globe, which may be felt above the *os pubis*, the softness of the edge of its orifice, the dilatation of it, and the presence of a body which begins to engage in the *vagina*, confirm it.

660. We favour the *deliverance*, by suffering the *placenta* to empty itself by the umbilical vein; by frictions on the *hypogastric* region, to excite or maintain the action of the *uterus;* and by pulling the umbilical cord.

661. When we pull the cord, in order to bring away the *placenta*, we ought to direct our forces in such a manner, as to make it descend according to the axis of the *pelvis*, which it often will not do without a particular precaution; either on account of the natural curve of the *pelvis*, or because of the situation of the woman, whose breech is more or less sunk in the bed. This precaution consists in forming a kind of pulley for the umbilical cord, with the extremities of the fingers introduced into the *vagina*.

662. For this purpose, the accoucheur having taken the cord wrapped in a dry cloth in one hand, must pull it horizontally, while he carries three fingers of the other hand united behind the *os pubis*, as far as the entrance of the neck of the *uterus*, to

push the base of the cord strongly backward, making it describe an elbow in that direction, in the same manner as if it were passed round a pulley.

663. By operating thus, although the cord be pulled in an horizontal direction, or nearly so, it is made to act upon the *placenta* as if it passed through the space between the *anus* and the point of the *coccyx*, and consequently nearly according to the axis of the superior *strait*.

664. This precaution is sometimes so necessary, that without it we might experience great difficulty in extracting the *placenta;* which might induce us to suppose it very voluminous, when it is only of the usual size; or imagine it very adherent, when entirely detached; and consequently make the accoucheur pursue a conduct quite different from what the circumstance would require.

665. When the *placenta* is descended into the *vagina*, we merely draw it towards us, by raising the hand which holds the extremity of the cord. As soon as the mass appears without, we take hold of it with the right hand, and support it with the left placed transversely, under the *vulva;* we then turn it five or six times round, in order to collect the membranes, and twist them like a cord.

666. No procedure is better calculated than this latter to bring away all the membranes, and prevent the accidents which have often been the consequence of the retention of some of their fragments in the *uterus*.

667. Whenever we find any difficulty in extracting the *placenta* by pulling the cord, we must search for the cause, by advancing a finger far into the orifice of the *uterus*. It is also very proper to continue the frictions which I have recommended, on the *hypogastric* region, to solicit the expulsive

action of the *uterus* more powerfully; and if the accoucheur cannot perform them himself, he must examine that region, from time to time, to inform himself of the degree of contraction and hardness of the globe of the *uterus*, that he may avoid dragging down the *fundus*, and inverting it.

Of Accidental Circumstances which oblige us to deliver the Placenta sooner or later, and to vary the Mode of Operating.

668. Of all the accidents which may oblige us to deliver the *placenta* before the union of all the signs indicated above, none is more urgent than a flooding; because the *uterus*, then weakened by the loss of blood, wants force to expel it, and its presence increases the hæmorrhage.

669. The hæmorrhage may be either apparent, or concealed. In the first case a stream of blood flows from the *vagina;* in the second, that fluid is extravasated in the *uterus*, whose orifice is stopped up by the *placenta*, so that its *parietes* become distended and its cavity filled.

670. This concealed hæmorrhage is never more to be dreaded, than after a labour preceded by a copious flooding, and especially if it be terminated suddenly; because the *placenta* being detached, and ceasing almost all at once to be supported by the child, presents itself at the orifice, before the *uterus* is sufficiently contracted to check the impulse of the blood. This accident may also happen after the *placenta* is delivered, if we should stop up the

vagina, without any other precaution, in order to oppose the flow of blood, continued by an *atony* of the *uterus*.—See par. 727 and following.

671. Frequent *syncopes* and convulsions ought also to determine us to extract the *placenta*, and other foreign bodies which are the cause of them.

Of the Method of delivering the Placenta in case of Flooding.

672. When the cord is whole, and sufficiently strong, it must be pulled with the usual precautions, while an assistant solicits the expulsive action of the *uterus*, by proper frictions on the belly. If the *placenta* resists these united efforts, we must introduce the hand cautiously into the *uterus*, to extract it. We must do the same when the weakness of the cord, or any other cause prevents our using it.

673. When the *placenta* is not entirely detached, we must search for the part where it is already separated from the *uterus;* and, insinuating the fingers behind it, destroy the rest of its adhesions, just as we separate two sheets of paper stuck together. During this time we are to take great care to fix the *uterus*, by pressing on the belly with the other hand (see par. 685,) and neglect none of the means usually employed in flooding cases.

Of Obstacles to delivering the Placenta, arising from an atony of the Uterus, and from a natural or spasmodic Contraction of its neck.

674. Though an atony of the *uterus* obliges us to deliver the woman instantly, when it is accompanied by a violent flooding, it prescribes a very different conduct when there is no hæmorrhage; for then we ought to do nothing which may occasion a separation of the *placenta*, till the *uterus* recover from its insensibility, and be in a state to contract itself.

675. The spasmodic contraction of the neck of the *uterus* generally produces no more than a momentary obstacle to *deliverance*. It rarely gives any trouble, unless it become universal, or is accompanied by any other accident. The particular species of complication must then determine the choice of the methods to be pursued.

676. When there are no obstacles to *deliverance* but what depend on the natural contraction of the neck of the *uterus*, it must be deferred as long as that state requires. The delay is never very long after a birth at full time; but, after abortions, it is generally so much the longer, as the pregnancy was less advanced.

Of Obstacles to Deliverance, proceeding from preternatural Adhesions of the Placenta; and of what must be done in those Cases.

677. The union of the *placenta* with the *uterus* may be so close and strong, as to resist not only the efforts of that *viscus*, seconded by those which we can exert on the cord, but even the immediate action of the hand; at least, unless we risk exposing the woman to accidents a thousand times more dangerous than those we would free her from by delivering her.

678. This union, however strict it may be, is never formed otherwise than by means of a cellular membrane more or less dense; and we never see any thing of those *uterine cristæ* which some accoucheurs have talked of, and which they suppose shoot deeply into anfractuosities of the *placenta;* which at least may secure us against any fear of tearing them, in endeavouring to detach the latter.

679. In general these adhesions are not equally strict in all parts. For the most part only a few lobes are thus identified as it were with the substance of the *uterus;* but these may be found at any part of the *placenta*.

680. When the *placenta* is partly detached the operation of separation is easier; but it presents more pressing indications, as an hæmorrhagy necessarily attends it. It is not always necessary to introduce the hand, when the connexion between the *placenta* and *uterus* may be a little more strict than ordinary, as this difficulty for the most part may be overcome by acting as stated in par. 662. When it adheres to the anterior part of the *uterus*, we gain the advantage spoken of in par. 662 by

placing the fingers before the cord; and when it is fixed to the posterior part, we place the fingers behind the cord; when it may be at the sides, we place our fingers agreeably to the rule just laid down.

681. The precaution of forming a pulley with the fingers, for the umbilical cord, to change the direction of the forces applied to its extremity, is never more necessary than when it is inserted in the lower part of the *placenta*. The reasons assigned for it by the celebrated M. *Levret* are so clear, that I cannot do better than recommend the reader to consult him on the subject.* " It very often hap-
" pens," says he, " in this case, that the *placenta*
" appears to adhere very strictly, when we pull the
" cord in the usual manner, because it no more
" tends to separate any part of its circumference,
" than we could slide a paper towards us, cut in
" form of a battledore, and applied wet on a plane
" parallel to its surfaces; for we should sooner tear
" off the handle of the paper, than separate it whole:
" whereas, if we lift up the handle to detach it, it
" easily quits the plane on which it is applied."

682. When the adhesions of the *placenta* resist the well-directed efforts which can be exerted on the umbilical cord, or when the cord is so weak that we cannot make use of it, many accoucheurs, even among the moderns, think it better to abandon the deliverance to time, and the efforts of nature, than to convey the hand into the *uterus* to perform it. This counsel, which we are sometimes obliged to follow, would be very prudent if we had nothing to fear from the retention of the *placenta:* but how

* M. *Levret*, Suite des Observations sur la Cause et les Accidens des plusieurs Accouchemens Labourieux, page 139, 4me edition.

many women have been victims to the accidents which seem inseparable from the putrefaction of that body (see par. 693), or from its presence only in the *uterus!*

683. We must then introduce the hand, to try at least to deliver the woman, and shield her from those accidents. This precept, authorised by the greater part of practitioners, becomes of the greatest importance, when the presence of the *placenta*, already detached in some part, occasions a copious flooding.

684. It is always advantageous to preserve the cord, whether we propose to deliver the woman immediately, or from prudence or necessity abandon the *placenta* to the efforts of nature. In the former case, it serves at least to direct the fingers to the mass; and, in the latter, to shake it from time to time, and even extract it, when the natural efforts shall have destroyed its adhesions.

685. As often as we pass the hand into the *uterus*, to detach the *placenta* from it, we ought to begin by fixing that *viscus* with the other hand applied to the *hypogastric* region; otherwise we should succeed with difficulty, and not without some risk of injuring the *uterus.*

686. We easily find the *placenta* while the cord adheres to it, because it serves for a guide; but we are obliged to seek for it when the cord is torn away. We then discover it by the following signs: 1. The internal face of the *placenta* is covered with vascular rays, very sensible to the touch. 2. The woman can scarcely distinguish the presence of the fingers when they touch that body. 3. The region of the *uterus* is softer, and twice or thrice as thick as any other part, comprehending the thickness of the *placenta* which is attached to it.

687. As it is very rare that the *placenta* is not already detached in some part, when we introduce the hand into the *uterus*, we must endeavour to discover that part; in order to continue the separation from that point to that which is farthest from it. But, when the *placenta* still adheres in all parts, we must begin the separation where it appears most convenient and easy.

688. When it is found already separated from the *uterus* in some part of its circumference the ends of the fingers must be insinuated under it, and the hand advanced gently between those two parts, as directed in par. 672.

689. When the mass is united to the *uterus* through the whole extent of its circumference, and is detached in the middle, we must pull the umbilical cord, to enable us to grasp the detached part with the ends of all the fingers; which is not difficult to do, because it presents itself, as it were, forming a projection more or less salient from the *uterus*. If this method does not succeed, we must endeavour to separate a part of the edge of the *placenta*, in order to insinuate the hand under it; or we may pierce it with the end of the finger, near the base of the cord, and finish its separation from the *uterus* by passing the finger all round behind it. I have succeeded by this means in a case of that sort, after I had tried other ways in vain.

690. Before we endeavour to extract the *placenta*, we must carefully observe whether it be entirely detached; for, being of a fungous nature, and easily torn, the adhering portion might remain in the *uterus*, and cause the same accidents as if the whole were retained.

691. There are however some cases, where far from persisting to extract the whole of the *placenta*,

prudence requires that we should leave a portion of it to nature. *Smellie* gives us an example of this sort in his excellent work; where we find he thought it better to follow this method, than to risk tearing the *uterus* by endeavouring to detach a portion of the *placenta* which appeared to him to be *scirrhous*. I have twice met with the same thing; and, in one of those cases, the portion of the *placenta* which I left in the *uterus*, with a perfect knowledge of the cause, was not expelled till six weeks afterwards. It was then about the size of a walnut, and so withered, that we could tear it without soiling the fingers.

692. If the adhesions of the *placenta* are so strict as to form in a manner one and the same body with the *uterus*, we must act as *Smellie* did, on account of a portion of it which appeared to him identified with that *viscus*, and as I have done myself; that is to say, abandon it for a time to the efforts of nature. The union of the *placenta* may relax, or dissolve; and it will then present itself readily to the hand of the accoucheur.

693. We must not however conceal how dangerous the consequences of this circumstance, happily very rare, may be; especially if we do not pay it the strictest attention. The putrefaction of the *placenta*, almost always inseparable from its retention in the *uterus*, may become the source of a multitude of accidents; among which a *fœtor* of the *lochia*, suffocation of the *uterus*, *syncopes*, a slow fever, and *insomnia*, are the slightest.

694. Accoucheurs have hitherto applied themselves more to provoke the expulsion of the *placenta*, than to prevent or moderate the effects of its retention; without considering whether nature were disposed to get rid of it, or whether there might not

be more inconvenience in extracting it, or provoking its expulsion, than in leaving it. Of all the remedies to which empiricism, rather than rational practice, has attributed the power of expelling the *afterbirth*, none are more dangerous than the greater part of those known by the name of *emmenagogues*. They inflame the mass of blood, instead of calming the irregular motion by which it is then too often agitated, &c.

695. Antiphlogistics and antiseptics ought rather to be employed, according to circumstances. Great advantages may likewise be derived from emollient, detersive, and antiseptic injections, repeated several times a-day. They relax the adhesions of the *placenta*, wash away the putrid matter which drains from it, and prevent the accidents which might be the effect of its absorption.

696. We must then touch the woman from time to time, to examine if the *placenta* be not detached; in order to extract it, either by gently pulling the cord, if it has been preserved, or otherwise; that it may no longer corrupt the *lochia*, or retain them in the *uterus*, by stopping its orifice; and that health may be more quickly restored.

Of the Retention of a Portion of the Placenta, and of Clots of Blood in the Uterus; and the Precautions necessary in those Cases.

697. The extraction of a portion of the *placenta*, or of a clot formed in the *uterus*, must be considered as a part of the *deliverance;* since the presence of such foreign bodies may cause the same accidents as the retention of the whole of the *placenta*.

698. It is not always from the *placenta* itself that those portions are detached which remain in the *uterus*, and oblige us to pass the hand into it. They are sometimes a species of *cotyledons*, little masses distinct from the principal one; and which form, as it were, so many little islands on the membranes; which makes it much more difficult to discover them.

699. We may discover whether any part of the *placenta* is left in the *uterus*, by collecting and putting together all which is extracted; but we cannot discover the existence of *cotyledons*, or those little masses I have just mentioned, but by introducing the hand into that *viscus*. The tearing of the *placenta* always makes us presume the presence of the former, and we may search for it immediately: whereas the traces which the others leave on the membranes, are exceedingly equivocal; so that we can have no certain signs of their existence, either immediately after *deliverance*, or in the sequel; because the accidents they produce may proceed from another cause.

700. The retention of these portions of the *placenta* is no otherwise alarming, than as it becomes the cause of other accidents, of which the most to be feared is an hæmorrhage. That may manifest itself sooner or later; I have seen it not appear till the tenth day after delivery. When it is abundant, as it was in that case, it requires us to pass the hand into the *uterus* to extract the foreign body from it.

701. When there are no other accidents but what are the consequence of the putrid dissolution of the retained portion of the *placenta*, we must have recourse to the injections indicated in par. 695, and vary them according to circumstances.

702. If we were certain of the existence of these

portions of the *placenta* at the time of the *deliverance*, it would be better to extract them immediately, than to wait till succeeding accidents oblige us to it: but if we are not called till some time afterwards, there must be very great accidents, to determine us to take the same method: because nature alone almost always delivers herself of these foreign bodies; and we have only to guard against the effects of their putrefaction, during their stay in the *uterus*.

Of Deliverance when the Placenta is encysted.

703. The *placenta* is said to be encysted, when it is contained in a cell making part of the cavity of the *uterus;* but which nevertheless sometimes appears as distinct, as that of the body of that *viscus*, in its natural state, is from the cavity of its neck.

704. When the cavity of the *uterus* is thus divided, the *placenta* is sometimes found in one cell, and sometimes in the other; or each of them contains a part of it, according to the place of its attachment. Thence we find *placentas* completely encysted, and others only in part.

705. In whatever manner the *placenta* may be encysted, the *deliverance* is generally performed in the usual way; it is only a little more difficult, because nature has to overcome not only the resistance of the neck of the *uterus*, but that of the entrance of the *cyst* also.

706. If we cannot perform it in the usual way, that is to say, by pulling methodically at the umbilical cord, while an assistant endeavours to solicit

the expulsive action of the *uterus*, we must advance the hand to the entrance of the *cyst*, dilate it properly, detach the *placenta*, and extract it, as has been already directed, whether we can make use of the umbilical cord or not.

Of Deliverance in those Cases where the Placenta is attached to the Neck of the Uterus.

707. We no longer fear now, as in the time of *Deventer*, being charged with advancing a paradox, in declaring that the *placenta* is sometimes attached to the neck of the *uterus*, and covers its orifice. Real practitioners are agreed on the certainty of this fact; because there are none who have not several times met with it.

708. When the *placenta* presents first, a flooding before delivery seems to be essential to it: but it may manifest itself sooner or later, according to circumstances. Sometimes it appears as early as the sixth month, sometimes not till the ninth, or even till the approach of labour; but generally from the seventh to the eighth month. It is always slight, and may be stopped by the usual remedies when it begins early; but it soon appears again, and becomes so much the more abundant, as the woman approaches nearer to the end of her pregnancy; so that it is never more excessive than during the course of labour.

709. We cannot discover whether the orifice of the *uterus* be the seat of the *placenta* or not, without passing the finger into it. Instead of the very smooth membranes which are usually felt, we then find a soft and fungous substance; all other signs

are uncertain, and exceedingly equivocal. But these examinations ought to be made with the greatest care, because they may become hurtful; for the finger may detach a salutary clot, which opposed, or at least moderated, the hæmorrhage.

710. As the choice of the best methods to be pursued in this case depends less on the place where the *placenta* is situated than on the violence of the hæmorrhage which proceeds from its separation, we need not trouble ourselves at the beginning with endeavours to discover its seat.

711. When the hæmorrhage is slight, or even moderate, we prescribe the most exact repose; and keep the woman as much as possible in an horizontal position: we bleed her, if circumstances require it; that is to say, if she appears plethoric; we give her none but the most cooling and incrassating drinks, and aliments of the same nature. If the hæmorrhage continue notwithstanding these precautions, and become more considerable, cloths dipped in vinegar and cold water may be applied to the belly; and we may introduce a kind of tent or pessary of fine tow or lint, moistened with the same liquor, into the *vagina*, or even into the neck of the *uterus*, if it be sufficiently open. If the flooding resists all these methods, and endangers the woman's life, we must excite the labour pains, and deliver her.

712. If this last resource is salutary to the mother, and preserves her life, we ought not to dissemble how dangerous it is to the child. It runs so much the more risk, as it is then farther from the period of its maturity, and as the neck of the *uterus* is naturally less disposed to give it a passage. But of two evils we must choose the least; though the child is endangered by this premature delivery, its

loss is inevitable if we neglect it, and that of the mother is not less so. We must not even defer it too long, in the hope that pains will come on, and the labour take place naturally, or that an hour's delay will produce more favourable dispositions; for that hope is perfidious: and an instant often decides the fate of two individuals, who might have been preserved by acting with a little more celerity, and less timidity.

713. Since we must then have recourse to delivery, we ought to perform it in the surest and gentlest manner possible. The method of *Puzos** cannot in this case have those advantages which have been generally found in it when the source of the hæmorrhage is farther off. In those cases the flooding ceases or diminishes after the evacuation of the waters, in proportion to the strength of the pains, and the diminution of the cavity of the *uterus;* so that the labour may sometimes be allowed to go on naturally, without danger to the woman. But when the *placenta* is attached to the neck of the *uterus*, if the hæmorrhage is suspended for a moment when the waters are evacuated, it soon appears again; and becomes so much the more abundant, as the orifice of the *uterus* dilates farther, and as the violence of the labour increases. I have met with but one case, where the flooding has entirely ceased after the evacuation of the waters, out of at least five-and-twenty where the *placenta* was attached to

* *Puzos* advised, in case of violent flooding, to excite the labour pains by dilating the neck of the *uterus*, and opening the membranes.—See his excellent observations on uterine hæmorrhages at the end of his work.

the neck of the *uterus;* but this single case cannot establish a rule.*

714. If in this case we should determine to evacuate the waters of the *amnion* before the state of the neck of the *uterus* will permit us to deliver the woman, and if as much benefit could result from it as in other flooding cases, it might be more advantageous to do it by passing a *trocar* through the *placenta*, than by making a hole in it with the finger: but I am far from proposing this method, as well because its application might produce inconveniences, as because the evacuation of the waters then cannot be of any utility.

715. When the orifice of the *uterus* is properly disposed for delivery, we detach the *placenta* from one side of it; and always, when we can discover it, from that side where its edge approaches nearest to the orifice. We tear the membranes at the edge of the mass, then search for the child's feet, and extract it as in common cases.

716. Some practitioners prefer piercing the *placenta* in the middle, and passing the hand through it to turn the child; but this method is more difficult, and less certain, than that which I propose. Those practitioners almost expose the *placenta* to a total separation by acting thus; and tear some of the principal roots of the umbilical cord. Besides, the child being obliged to descend through the *pla-*

* A midwife had extracted the *placenta* some hours before I was called, and had not been able to turn the child, whose arm was engaged below the head. The *uterus*, irritated by the manœuvres of the midwife, was strongly contracted on the child, and discharged but a few drops of blood. Astonished, after the extraction of the child, to see the cord was torn off near the *umbilicus*, and more surprised still not to find the *afterbirth* in the *uterus*, I discovered that it had been extracted a long time before my arrival, and carefully concealed:

centa, seldom fails to bring it along with its shoulders: which augments the difficulties, by adding the volume of that mass to that of the shoulders; and occasions some other inconveniences.

717. When the *placenta* still preserves a part of its adhesions to the *uterus*, after the exit of the child, we ought to wait till the action of that *viscus* has destroyed them, before we extract it; unless a continuance or renewal of the hæmorrhage obliges us to deliver the woman sooner. In all these cases, as well as in those where the *placenta* is attached in the neighbourhood of the orifice, the whole of the membranes seldom come away, without the greatest attention; because they detach themselves circularly from the *placenta*, if their adhesions resist ever so little. We must then take all possible care that they may not be left behind, lest their stay in the *uterus* should be the cause of troublesome accidents; and the accoucheur should be taxed with inattention and unskilfulness, when they are seen to come away afterwards, in the form of a portion of the *afterbirth*. In order to extract the whole of them, we must take hold of them close to the *placenta*, as soon as that is without, and pull them cautiously; while with the other hand we solicit the *uterus* to expel them by frictions on the *hypogastric* region.

Of Deliverance after an Abortion.

718. Cases in which we may be obliged to commit the *deliverance* to nature, and confess the impotence of art to effect it, are never more frequent than after abortions; since we then have scarcely any of those resources, which we meet with after a birth at full time.

719. The difficulties of delivering the *placenta*, in these cases, generally increase in an inverse proportion to the term of gestation: they are so much the greater as that is less advanced, and diminish in proportion as the abortion or delivery approaches nearer to the period of nine months.

720. Before the third month, nature finds fewer difficulties in freeing herself from the whole produce of conception at once, than in expelling the afterbirth separately; but after that period we observe the contrary. Experience teaches us, moreover, that it is very rare that those deliveries are not performed according to the intentions of nature, when the accoucheur does not disturb her course by seeking to assist her; for it is as rare to see the *fœtus* precede the exit of its *involucra*, before the third month, as to see it come enveloped in them after the fourth.

721. According to this natural indication, we ought never to open the membranes with a view of abridging the labour of an *abortion*, however tedious it may be, when it takes place before the third month; as we ought never to fail to do it after that epoch, if the membranes do not tear of themselves, as soon as the orifice of the *uterus* is sufficiently dilated to give a passage to its contents.

722. In the former case, if the membranes should open spontaneously, or otherwise, before the orifice of the *uterus* be sufficiently large to expel its contents entire, they discharge the waters and *fœtus*, which is still very small: they afterwards collapse, and cannot be expelled but by a much longer labour, and which is often retarded several days; because by that evacuation the *uterus* loses a part of the sensibility and irritability it had acquired, and which were necessary for the farther progress

of its contractions; and because its orifice closes during that state of rest.

723. If we were near the woman at the time the membranes open, we ought to introduce one or two fingers into the orifice of the *uterus*, to hinder it from closing, and favour its farther dilatation, till it be sufficient for the *deliverance;* which would then take place without any more trouble, and in a very short time, but when we are not called till after the discharge of the waters, we must wait patiently, unless a flooding oblige us to act.

724. But how can we deliver the woman in this latter case? The umbilical cord, brought along by the *fœtus*, is torn off; and is besides so slender, that it could not be used in extracting the *placenta.* The external parts of the woman, and the entrance of the *vagina*, are so close, that the hand could not penetrate it without force, and exciting a great deal of pain; the neck of the *uterus*, scarcely at all dilated, will admit at most but a single finger, which, far from serving to extract any portion of the *placenta* that might be engaged in it, could only push it back again towards the *fundus.*

725. When all things are in a state so little favourable to *deliverance*, if the flooding is not violent, the accoucheur must content himself with soliciting the action of the *uterus* briskly, and endeavouring to make it contract with sufficient energy to finish the detachment and expulsion of the *placenta.* By this means he may often obtain from nature, in a quarter or half an hour, what he could not have obtained otherwise without a great deal of time and trouble.

726. When a portion of the *placenta* is engaged in the neck of the *uterus*, so as to project a little into the *vagina*, we may take hold of it with two

fingers, in order to loosen and bring along the rest: but it must be done cautiously, lest we tear it; which would but retard the complete *deliverance.*

727. Though we may temporise thus, or confine ourselves to these feeble succours, when the flooding is moderate, we must act very differently when it is so considerable as to put the woman's life in sudden danger. If we cannot extract the *placenta* immediately, we must, without delay, stop up the passage, and hinder the blood from flowing; and by that means cause the formation of a *coagulum*, which, by exactly filling the cavity of the *uterus*, may stop the mouths of the gaping vessels, and check the violence of the hæmorrhage. For this purpose we may introduce a piece of agarick into the neck of the *uterus;* or, if we can, a plug of very fine tow, or lint, moistened with vinegar and water, with which the *vagina* may be entirely filled; we must take care to support this plug properly, till the *uterus*, irritated by its presence, by that of the *coagulum*, and the *afterbirth*, contract with sufficient force to deliver itself of them all.

728. This method, whose utility has often been proved by experience in cases of abortion, as well as in those of inveterate or habitual hæmorrhage, might have very disagreeable consequences if we were to employ it without any other precaution, after a delivery at full time: because there might then be an internal extravasation capable of destroying the woman, as we see in one of the observations of La Motte;* the cavity of the *uterus* then being too vast, and its *parietes* giving too little resistance to the influx of blood. If we should be obliged to plug up the *vagina* in the latter case, as I have done

* Observation 386, nouv. edit.

several times with success, we must, while we support the plug with one hand, oppose the development of the *uterus*, by pressing on the *hypogastric* region with the other, and grasping, as it were, the body of that organ with all the fingers.

729. When the *placenta* of an abortive *fœtus*, which we cannot extract, putrefies in the *uterus*, and produces any of the accidents stated in par. 693, we must have recourse to the injections prescribed in par. 695; but, if nothing of that kind happen, we need not be uneasy about it. Some women, after retaining it several months without being at all incommoded by it, have at length discharged it, withered and reduced to almost nothing.

Of Deliverance after the Birth of Twins.

730. The connexion which twins almost always have by means of their *involucra*, shows us of what importance it is, not to undertake to extract the *placenta* till after the birth of the last; though some observations seem to authorize the contrary practice.

731. Each twin having sometimes its *involucra* very distinct, and perfectly separate, and the *placenta* of one being only placed close to that of the other, we might without the least inconvenience, immediately after the exit of the first child, extract its *afterbirth*, and do the same with regard to the second: but how can we discover this case, which is besides extremely rare, before we proceed to the *deliverance?* As no signs can enlighten us on this point; and as it much oftener happens that there is but one *placenta* for the twins—or that the two masses are so

bound together by means of the *chorion* which envelops the two children, that we could not extract one without detaching the other at the same time, which might be equally dangerous to the mother and the second child—we ought never to attempt it till after the exit of the latter. I only except the case where the *afterbirth* of the first child presents itself, as it were, to the hand of the accoucheur.

732. Since then we ought not to extract the *placenta* till after the exit of the last child, except in those cases where nature points out a different mode, by pushing the *placenta* of the first to the entrance of the *vagina*, perhaps it would not be useless in the mean time to tie the cord which descends from that mass, as some have recommended: but we must untie it again at the time of its extraction, in order to empty the common *afterbirth*, and by that means favour its *deliverance*.

733. We begin by pulling both cords, and proceed as if there had been but one child. If the *placenta*, more voluminous than in the latter case, does not yield to these efforts, we may act on only one of the cords, in order to bring down the two masses, one after the other; and if we still meet with the same difficulty, we may introduce two fingers into the neck of the *uterus*, and endeavour to bring it along edgewise.

Of what is to be done immediately after Deliverance, during the Time the Woman must remain on the Couch.

734. As soon as the *placenta* is delivered, whether that operation has been performed spontaneously or not, the accoucheur ought to inform himself, by touching, whether the *placenta* has not drawn down and inverted the *fundus* of the *uterus*, or whether the whole of that *viscus* be not descended too low; that, in the latter case, he may raise it up; and, in the former, reduce the inverted part immediately.

735. When, in this respect, every thing is in the natural order, it will suffice to rub the *abdomen* with the hand, and repeat it now and then, to excite and maintain the spring or tonic action of the *uterus*, to favour its depletion, and prevent the formation of clots, which often become the source of many accidents.

736. As the woman ought to remain some time on the couch where she has been delivered, either to rest herself a little, or because it would be imprudent, and even dangerous in some cases, to move her immediately (as in those when the delivery has been preceded or followed by an hæmorrhage, by *syncopes*, or any other accident; as also when there is any reason to fear they may happen), she must be kept clean by substituting dry clothes for those which are wetted.*

737. She must be kept at first as much as possible in a horizontal position; she may draw her legs

* The inconveniences here spoken of, are obviated by having the patient placed as recommended in note to par. 585.
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up and down; she must be covered according to the season, and be enjoined silence, and the most exact repose.

738. It is not less necessary to keep the mind quiet, than the body: experience proves that every thing which affects it strongly, may have disagreeable consequences. How many women have been victims of an impulse of joy, of immoderate anger, or other similar passions, immediately after delivery!

739. If the woman is thirsty, we may give her some of those drinks, mentioned in par. 516, or a little broth, if necessary. But we ought to proscribe entirely the use of spirituous liquors and heating potions, which are indiscreetly taken by the lower class of people, whether with a design to raise the spirits, or prevent afterpains.

740. Before we remove the woman, we must take every thing from her that has been moistened with sweat, or with the waters and blood which have drained from the *uterus*. This is what the nurses call putting the woman to bed. Though the accoucheur is rarely admitted to this toilette, and still more rarely obliged to put his hand to it; it is however proper that he should know in what it consists, and be acquainted with its advantages and abuses.

Of putting the Woman to Bed.

741. Nothing is indifferent in the time of lying-in; at that time things the most simple in appearance sometimes becomes very pernicious: and women are often victims of a vain advantage which they endeavour to procure for the time to come; or at least of their ignorance, or of that of their nurses. Those

women will perhaps be obliged to me for attending to their first adjustment; then it will be of little importance that some accoucheurs reproach me for having entered into these details.

742. Every nation has, as I may say, its particular manner of dressing and managing lying-in women: the same method perhaps cannot pass every where for the best. I shall speak only of that which is in use among us; but I must premise that fortune has caused as many varieties in it, as she has established different conditions among women.

743. After removing every thing wet from the woman, she has a short shift open before put upon her; this shift reaches no lower than the waist, that it may not be soiled with the *lochia*. Over this shift a bed gown with long sleeves is put. A bandage is then placed round the *abdomen*, the utility of which has been demonstrated by *Smellie*.

744. Experience, which had confirmed its advantages to me before I knew the precepts of *Smellie*, has since taught me that it may be made useful in some cases of flooding after delivery, by making a pressure on the abdominal vessels, and moderating the course of the blood towards the *uterus*. At other times it opposes the dilatation and puffing up of the intestinal canal; it prevents hernias, by resisting the impulsion of the floating parts. Lastly, I have remarked that, at the same period after delivery, those women who had not had the belly gently confined in the first days had the *uterus* more voluminous and plethoric than others.

745. It seems to me, according to these observations, that this bandage ought not to be omitted; and that in some cases, it should be applied immediately after *deliverance*.

746. The bandage for the belly is made in the

following manner:—We first apply a very soft napkin, folded in a square or triangular form, to the *hypogastric* region; then apply another over it, folded lengthwise, which must go round the belly. It should not be very strict at first; but we may afterwards tighten it by degrees, in proportion as the volume of the *uterus* diminishes.

747. A kerchief on the neck, a cloth round the loins and thighs of the woman, after the manner of a petticoat, and a soft napkin applied to the *vulva*, must finish her adjustment. We then transport her to the bed, and prescribe a regimen according to her condition.

748. It would be difficult to fix the method of treating women in the month, or even to establish general precepts on the subject, without first making known the principal phenomena which manifest themselves after delivery, and their differences relatively to the various circumstances which may happen. I shall state them very briefly.

Of the principal Phenomena which manifest themselves in the Month.

749. The symptoms subsequent to delivery have been distinguished into natural and accidental. The former present us with an infinite variety, dependent on the constitution of each individual; the latter are sometimes the effect of a predisposition to disease, which labour has only called into action; and sometimes they depend on the bad habit of the subject, the unskilfulness of the accoucheur, the neglect of a proper regimen, or on some unforeseen events. I shall only speak of the usual subsequent symptoms.

750. A kind of faintness, or lassitude, like that which is felt after violent exercise, soon succeeds to the agitation excited by labour: but the pulse quickly revives, a warmth is diffused through the body, the skin becomes moist, a salutary perspiration breaks forth, the limbs recover their former liberty, the order of the functions is re-established: and a perfect calm succeeding to this violent effort of nature, permits the woman to enjoy peaceably the happiness of being a mother.

751. During the first days there is a copious discharge at the *vulva*. At first, of pure blood, whose colour and consistence begin to weaken sooner or later, and diminish insensibly; so that, in about twenty-four hours, it is commonly nothing but a reddish serum, which soon after changes again. It becomes in a short time thicker and whiter, and, as it were, purulent; which has caused it to be called *puriform lochia*, while the two former species are named *sanguine* and *serous*.

752. The duration and quantity of these different species of *lochia* likewise depend on a great number of different circumstances, which I shall not mention in this place. The *sanguine lochia* sometimes flow during the first two days, with or without pain; which depends on the state of the *uterus*, and the nature of the blood, which sometimes passes fluid, and sometimes in clots.

753. If we were less acquainted with the mechanism by which these first *lochia* stop, it would be matter of astonishment that all women do not perish by an hæmorrhage soon after delivery; so great is the diameter of the vessels, at that time, which transmit the blood to the *uterus* (see par. 400). Though this evacuation seldom continues beyond the two first days, it is very common for

the blood to reappear from time to time during the first weeks, and even the whole month; which proceeds from the weakness of the uterine vessels, and the preternatural size which some of them still retain.

754. The source of these different kinds of discharge sometimes seems to dry up from the second to the third day, but for twenty-four hours only, or thereabouts. The *lochia* seem then to return into the blood, and be translated to the breasts; and a crisis, more or less violent, is produced, which is called the milk fever.*

755. This crisis is announced by shooting pains in the breasts: a swelling and tension soon after succeed; and their volume insensibly augments, to that degree in some women, that the skin seems to be in danger of bursting. The *engorgement* often extends to the *axillæ*, and sometimes renders respiration difficult and laborious. The pulse during this time becomes strong and quick, the head grows heavy, the face red, the woman suffers a kind of universal lassitude, and feels pricking pains all over the body.

756. A sweat more or less abundant, and whose sour smell sufficiently denotes its milky nature, at length always restores a calm. It often continues

* I am convinced that this milk fever is in great measure, if not altogether, of artificial origin. It never occurs to patients who strictly follow my directions after delivery. It is the product of improper regimen. When women, who are not predisposed to fever, are kept quiet, from all stimulating drinks, from animal food and broths, who have cool and diluting drinks, as water, toast water, balm tea, &c. who have fresh air freely admitted into their chambers, who have frequent changes of cloths, who have their bowels freely opened on the second or third day, never have this milk fever as it is termed. W. P. D.

twenty-four hours, or even longer, with very short intervals. We ought to do nothing that may disturb it; and it might be equally disadvantageous to endeavour to provoke it by loading the woman with blankets, or by giving her those heating potions, against the use of which I have already explained myself. All we ought to do is, to favour this evacuation when we find nature disposed to it.

757. The suppression of the *lochia*, during this crisis, is so natural a consequence of it, that we ought never to be uneasy about it. The discharge returns of itself when the sweats become less abundant; and the *lochia* then resemble a milky or purulent matter, which afterwards acquires more or less consistence.

758. At the end of the fourth day the swelling of the breasts usually begins to lessen; as they now empty themselves by the nipples. Women who suckle are seldom attacked by the milk fever which I have just described; because they transmit to the child from time to time the redundant fluid which causes it. They sweat less abundantly than other women; their breasts do not swell so much: the *lochia* flow not so long; and if that evacuation is suspended on the third day, it often afterwards returns in very small quantity.

Of the Regimen for Women in the Month.

759. Regimen extends not only to the aliments, but to every thing which relates to the *non naturals*, whose influence on the animal economy is never more sensibly felt than at this time.

760. Nothing is of greater importance than the quality of the air: the example of epidemics, which so often exert their fury in large hospitals, where poverty crowds so many women together, proves how important it is that that fluid should be pure, and free from corruption. An air too hot, or too cold, is not less hurtful to women newly delivered, than that which is loaded with the heterogeneous particles I have just mentioned. It is very essential that the chamber they are in should be well situated, and capable of being well opened, in order to renew the air from time to time, and warm or cool it, as occasion may require.

761. The woman ought to receive no more visits on the first days than are absolutely indispensable. She ought to be lightly covered in bed, except it be in winter; having more regard to the season and the habits of the woman, than to the puerperal state. The curtains of the bed ought never to be close, unless while the windows and doors are opened to renew the air.

762. The chamber ought to be as far as possible from noise, and no more talking allowed in it than necessary, that the woman may rest quietly, and not be waked with a start, nor incommoded by the noise and shaking of carriages, which is too much the case in great cities. The chamber ought moreover to have but little light by day, and only one candle at night, which should be kept from the eyes of the woman.

763. We ought not to oblige women newly delivered to continue constantly in the same position, and remain on the back the first twenty-four hours, as is but too often recommended to them: nothing being more capable of relieving them after the fatigue of labour, than the liberty of moving their limbs, and changing their attitude, they ought not to be hindered from doing it, except after a flooding, or when there is some reason to fear that accident. If nothing of that kind is to be dreaded, they may lie sometimes on one side and sometimes on the other; or even sit up a little, if their strength will permit it.

764. Strong passions being not less to be feared in the puerperal state, than immoderate motion of the body, we ought to inspire her with none but what are gentle and agreeable, and keep every thing from her that may cause any agitation. I have known some who have been victims of an impulse of joy; and others struck with an apoplexy and mortal convulsions by a fright; and some who have sunk in a few minutes under the regret of seeing the child carried away by the nurse they had provided for it.

765. Nothing is more conformable to the intentions of Nature, than to favour the evacuations by which she endeavours to rid herself of the milky humour with which she is overloaded. To excite or maintain that of the bowels, we may order an emollient glyster every day, or even two, if the woman should be troubled with the cholic. We ought not to dispense with them, except at the time of the crisis and copious sweats which I have already mentioned. They may be continued after this epoch, and now and then rendered more laxative, by the addition of three or four ounces of honey,

or of *mel mercurialis*, or something more active, if the case require it.

766. The discharge of urine, and the moisture of the skin, may be kept up by drinking plentifully of barley water, or a decoction of dog grass with a little liquorice; a light infusion of the flowers of linden, camomile, matricaria, elder, or other things of that kind. Common water, almost cold, with a little syrup of capillaire, or of marshmallows, ought to be the ordinary drink of those who cannot take the others.

767. These drinks also favour the discharge of the *lochia*, and are almost always sufficient to recal them when they are suppressed; an *engorgement*, an *erithismos*, or an inflammation of the *uterus* being generally the cause of that suppression.

768. We are very rarely obliged to have recourse to infusions of mugwort, rue, saffron, &c. nor to any of those heating potions still so frequently given to the wives of the common people, abandoned to the care of a nurse, or of one of their neighbours: hot wine with spices is not less dangerous. When the suppression of the *lochia* arises from one of the causes indicated above, emollients and diluents are the only proper remedies.

769. Those drinks and heating potions are however useful in some cases where there is more weakness than astriction in the vessels of the *uterus:* but as it often happens, when we prescribe a light infusion, that the women substitute a strong decoction of the plants ordered them, of which I have several times been a witness, the accoucheur ought to explain himself clearly on this subject, and determine the quantity proper for a quart of drink.

770. The quantity and nature of the aliments which a woman newly delivered ought to take,

must be determined by circumstances. According to some, we cannot keep women who do not suckle to too strict a diet; but that little alteration need be made in the way of living of those who perform that important duty. Such vague precepts may be equally pernicious in both cases.

771. We are often obliged to allow a free diet to the former, and keep the latter very strictly; because their habits have been different, &c. I have often thought it necessary to prescribe food to some women, accustomed to eat much, in order to calm symptoms, which in others would have required abstinence.

772. When nothing extraordinary happens after delivery, we may without fear allow the woman two little basons of broth a day, or even three; with rice, or otherwise: or a little soup with a crust of bread. Though it is necessary to deprive her of the broth during the continuance of the milk fever, we may afterwards add a little chicken or other solid food, and a little good wine mixed with water, according to her taste.

773. The day of the milk fever we must keep the patient to thin gruel, and make her drink abundantly; in order to furnish a proper vehicle for the milky humour, and restore the serum to the blood, which it has been deprived of by the sweats which break out at that time.

774. Some women are scarcely delivered before they apply cloths dipped in wine and oil to the *vulva*, to allay the pain and irritation which they suffer in that part; afterwards, they lay aside the oil, and use only the wine, in which some of them boil roses, and even things more astringent. These latter lotions are never more usefully employed than by women subject to a relaxation of the *vagina*, a de-

scent of the *uterus*, or in whom the *symphyses* of the *pelvis*, softened during pregnancy, retain too much mobility after delivery: but we ought to be careful not to employ them inconsiderately at the beginning. Emollient, softening, and relaxing lotions are the only ones proper at that time.

775. These latter are commonly made of milk with a little chervil boiled in it. Or we may substitute a decoction of marshmallows, agrimony, or barley.

776. In many cases, it is not less useful to foment the belly, during the first days, with flannels wrung out of hot water, milk, or a decoction of emollient plants; in order to keep it soft, and favour the depletion of the *uterus*, which some degree of *erithismos* renders more difficult in many women.

777. The *sal de duobus* is too frequently given to women in the month, to be passed over in silence. It seems consecrated to their use, and every matron thinks herself at liberty to prescribe it, as soon as the milk fever is over. It is not however an indifferent medicine: many women are not able to bear it, even in a small dose. Though there may be a few cases where it is really indicated, there are a much greater number where we may do without it.

778. It is also custom, rather than reason and the good of the woman, which has fixed the time for changing the shift and other parts of the lying-in dress: except the cloths that receive the lochia, which are changed often, that favour is not granted to the woman till the seventh, or ninth day. But why should she be left thus, as it were, immersed in excrement, when no state can require more care and cleanliness than the puerperal?

779. I am of opinion that women may change their linen much sooner, and as often as it is moist

with sweat, or otherwise; provided that what is substituted be very dry, and properly warmed. They may also from the first days be carefully moved into their little bed, while their own is made, and the sheets changed if necessary. But they ought to avoid walking as long as possible, and never attempt it in the first eight or ten days, even after an easy labour. By observing this precaution, they will be less exposed to a relaxation of the *vagina*, a descent of the *uterus* and other inconveniences which are the consequence of those.

PART III.

Labours of the second Order, commonly called Preternatural.

780. It is pretty generally agreed to call those labours preternatural, in which the child presents any other part but the crown of the head to the orifice of the *uterus;* because it was falsely imagined that in that case it could not be born without assistance. I have already observed that among those parts there are several, as the feet, the knees, and the breech, whose presence not only does not always render the labour essentially preternatural, but not always more difficult, or more subject to accidents, than that where the child presents the crown of the head.

Of the Cases which may render Labour Preternatural.

781. A labour may be essentially preternatural, or become so accidentally. In the first case, it is always the bad situation of the child which is the cause of it; in the second, a variety of circumstances may complicate it, which I consider as so many accidents.

782. In order to have a just idea of what is to be

here understood by a bad position of the child, we must recollect what has been already said of its dimensions, and of those of the woman's *pelvis;* and remember that it cannot be born without presenting to the orifice of the *uterus* one of the extremities of its largest diameter, or of the oval figure in which it is naturally folded. Its situation is then essentially bad, whenever it does not present the crown of the head, the feet, the knees, or the breech. If there are cases where the child may be born without help, though it presents neither of these parts, they can only be considered as exceptions to the general rule, and cannot happen except when the child is very small relatively to the *pelvis* of the mother.

783. When several parts present successively to the orifice of the *uterus*, if at any time we find the head there, we ought instantly to pierce the membranes, and discharge the waters.

784. Among the causes of preternatural labours in general, none is more justly so called, than a deformity of the *pelvis*. It seems indeed rather to belong to the third order of labours than to the second; since in that case the hand alone is seldom sufficient to deliver the woman; except the deformity be very slight. Therefore I shall not enter fully into the discussion of it, till I come to the fourth part of the work.

785. The accidents which do not permit us to abandon the labour to nature, either because it would endanger the life of the mother, or of the child, and often both; or because it absolutely cannot be performed without help, are an hæmorrhage, convulsions, and frequent faintings or *syncopes;* an exhaustment of the woman's strength, a lingering or cessation of the pains, the existence of an irreducible hernia, with a disposition to strangulation; some-

times the obliquity of the *uterus*, or the contraction of its neck round that of the child; at other times the presence of several children, who reciprocally prevent each other's exit; the issue of the umbilical cord; its shortness, and its being twisted round the child's neck, if we adopt the common opinion on that subject; and many other causes besides, which will be stated in the latter part of the work.

Of Hæmorrhage, considered with respect to the Necessity of immediate Delivery.

786. The hæmorrhage known by the name of flooding, may endanger the lives of both mother and child during pregnancy and labour; it is always the consequence of an accidental separation of a portion of the *placenta* from the *uterus*, and may happen at any period of pregnancy.

787. This species of hæmorrhage is not always apparent; for the blood, instead of being shed without, is sometimes extravasated behind the *placenta*, and retained there by the strong adhesions of its edge to the *uterus*, sometimes by those of the membranes, and sometimes by the natural contraction of the neck of the *uterus* itself, which is not yet open at the time when the extravasation takes place; which establishes two species of uterine hæmorrhage, one apparent, the other concealed.

788. Though the structure of the *uterus*, and the resistance which its *parietes* oppose to the agents of its development, seem to favour the opinion that much blood cannot be extravasated behind the *placenta*, experience does not coincide with that opinion, but has several times proved to me that this

sort of extravasation might become so considerable as manifestly to affect the strength of the woman and the life of the child.* Besides, the dyke, which

* There was an extravasation of this kind in Madame de * * * *, after being bled in the arm, which had occasioned frequent *syncopes;* and the symptoms, stated in par. 790 and 791, appeared almost immediately. The pains continued during three weeks, becoming stronger every day; and this lady was delivered of a dead child, at the period of eight months. There were behind the *placenta* two clots of blackish blood, solid, and in a manner dried, of the size of a duck's egg each.

In another woman, the *coagulum*, which covered two thirds of the *placenta*, was as large as the *placenta* itself; and in a third I estimated it at four or five porringers: they were each of them delivered of a dead child, after having suffered most of the symptoms described in the paragraphs indicated. The extravasation became more considerable, and the consequences of it were more fatal in another woman, which the limits of this work will not permit me to relate at large. This woman, after a long walk, felt some dull pains towards the *fundus* of the *uterus*, and the loins, which continued all night, and which she compared to those which had been used to precede the *menses*. Having got up the next day as usual, great and frequent faintings, and the fear of a violent flooding, upon seeing a little watery blood appear, obliged her to go to bed again a few hours afterwards: it was about ten o'clock in the morning. Her weakness and exhaustment, the *syncopes* which were continually repeated, and the paleness and alteration of her countenance, not being accountable from the small quantity of blood she had evacuated, for there appeared scarcely a porringer full, besides a few cloths slightly tinged with it, made me suspect an internal extravasation: the rapid augmentation of the volume of the *uterus* since the evening, by the account of the woman and the family, strengthened that suspicion, and new symptoms soon confirmed it. About seven months advanced in her pregnancy, and scarcely showing it before this accident, the *uterus* was so developed, as to make any one, at first sight, suppose her at full time, and pregnant of two children rather than one. The expulsive action of the *uterus* manifested itself about the time of my arrival, and the orifice began to dilate. It was scarcely open before the pains, though weak, expelled a quantity of clots black and soft, more than the crown of a man's hat could hold. The blood continu-

retains the blood thus, must be broke through sooner or later; the hæmorrhage then becomes apparent, and a fresh loss of blood which the vessels pour out plentifully, increases the danger which already existed from the former.

789. It is not only in the species of accidental *capsula* which I have just mentioned, that extravasations of blood may be formed during pregnancy; they may also take place in the cavity of the membranes which envelop the child: but from a different source. M. *Levret* relates an example of it, from a rupture of the umbilical cord;* and de la Motte, whom we cannot suspect either of falsehood or ignorance, assures us that he has seen the blood flow through the meshes of the coats of the vein, which makes part of the cord, in a place where it was be-

ing to flow afterwards, the danger augmenting, and the little hope of preserving the woman by deferring the delivery, determined me to perform it. I executed it in presence of two surgeons, who were sent for before me: but it was without success; the child having scarcely survived it an instant, and the woman having died five hours afterwards, in a paroxysm of *syncopes* and hysterics, which nothing could prevent or moderate.†

† I can add my testimony in favour of what our author has just advanced on the subject of internal hæmorrhagy. I was called to a poor woman whom I found dead on my arrival from this kind of flooding, joined to an apparent one; as the latter had not been sufficiently abundant to procure death; and as it was asserted by the midwife and women that, she became larger after the external discharge, which had been by some means or other arrested, I suspected an internal hæmorrhagy; leave was obtained to inspect the body, and my suspicions were verified. I shall elsewhere give this case in detail.
W. P. D.

* Levret, Suite des Observ. sur la Cause de plusieurs Accouchemens Laborieux, obs. 35me, page 199, edit. 4me.

come varicous.* From the testimony of my own senses, I can assert that the cord may be ruptured or torn partially before the birth of the child, and shed a great deal of blood into the cavity of the membranes.

790. The diagnostic of these extravasations is not so easy as that of common floodings: the latter cannot be mistaken; but the former may remain a long time doubtful, unless it increase very suddenly. A dull deep-seated pain, accompanied by a sensation of weight in the place where the extravasation is made, manifests itself almost at the instant of its commencement, and augments insensibly with it. The region of the *uterus* under which this collection is formed, rises in proportion to its quantity.

791. The extravasation cannot become considerable enough to produce such changes in the volume of the *uterus*, without strongly exciting its expulsive action: nor is it long before pains are felt similar to those of labour, and labour is soon the consequence of them. Those pains which are signs of the contractions of the *uterus*, driving the blood forward, we see clots come out as soon as the orifice is sufficiently open, if the extravasation has been made behind the *placenta;* but not till the opening of the membranes, when the collection has been formed within their cavity: in the latter case, the waters which precede the clots are tinged with red.†

* Observ. 249, nouv. edit. tome ii. page 725.

† The concealed hæmorrhage may take place some hours after labour has begun, as appeared in the case I alluded to in last note; pain or the contractions of the *uterus* were suspended most probably after this discharge happened, as the patient said she was now free from pain and wished to be allowed to sleep. W. P. D.

792. The necessity of delivery, without any regard to the period of gestation, when the flux of blood is so copious as to endanger the lives of the mother and child, has been acknowledged for two centuries back; and the precept is so much considered as a law among us, that we could not act otherwise without being taxed with ignorance. This practice, founded on the theory of the cessation of floodings after delivery, is confirmed by a great number of observations. A long and too fatal experience has equally proved, that an hour's, and even a moment's delay has in many cases cost the lives of both mother and child.

793. Though we cannot dispense with delivery, it is not less important to proceed to it in the gentlest and most advantageous manner. The conduct to be pursued must be guided by the intensity of the flooding, and the time when it manifests itself with violence. Sometimes it begins and becomes abundant, while the neck of the *uterus* retains all its natural thickness and firmness, and the orifice, scarcely begun to open, will with difficulty admit the finger; at other times, it does not happen till later, when the parts are already prepared for delivery, or when the labour is begun, and even considerably advanced.

794. In the former case, whatever abundance of blood the woman may lose, nothing could justify the conduct of the accoucheur who should persist in endeavouring to deliver without delay. He ought to content himself with checking or moderating the hæmorrhage by the application of cold and stimulating liquors to the belly and thighs of the woman; and especially by stopping up the *vagina*, and the neck of the *uterus* if he can. If he obtains no advantage by these means, he must excite the labour pains,

by gently stretching the edge of the orifice of the *uterus*, and making strong frictions on the belly, either with the hand, or with a hot napkin. If the flooding continues notwithstanding these aids, he must open the membranes, that the *uterus* may close on the child; and continue to excite the pains till the labour be well established.

795. When the flooding diminishes in proportion as the pains augment, we may leave the expulsion of the child to the care of Nature; but if it continues so long as to weaken the woman, the child ought to be extracted. We may then gradually dilate the neck of the *uterus*, by introducing the fingers successively, and remove the child's head, if that presents, and turn it and bring it by the feet.

796. When the pressing danger which arises from the flooding does not appear till the child's head occupies the cavity of the *pelvis*, we ought to prefer the forceps: supposing the accoucheur has them at hand; for the accident is too serious to allow him time to send for them. Otherwise he may still push back the head, though pretty far advanced, and search for the feet. See par. 959, and following.

797. The danger being the same in all cases of violent flooding, whether the blood flows freely without, or is extravasated within, we must proceed in this manner; because the open or ruptured vessels cannot cease to pour out the blood, till the contraction of the *uterus* shall have determined a sufficient change in their direction and diameters, to hinder it from passing easily through them. See par. 400 and following. The precept of immediate delivery in case of a violent hæmorrhage from the nose, or mouth, cannot be so generally admitted at all periods of gestation, as in those of flooding; even

if it should be certain that the strong pressure of the *uterus* on the abdominal vessels was the determining cause of that hæmorrhage, but I do not hesitate to recommend it, when that accident happens during the efforts of labour; for it would be as unskilful to expose the woman to a long continuance of those efforts, or not to deliver her, as to suffer her to sink under a common flooding.*

* There are few cases of disease occurring during pregnancy or labour that are so alarming in their appearance, and serious in their consequences as Hæmorrhagy. Our author lays down in a very judicious manner all he knew on the subject of this disease, but was not in possession of one of the most powerful remedies yet discovered for the suppression of hæmorrhagy; I mean the *acetate of lead.* Its general certainty in this accident is now so well established, that it would be loss of time to dwell on it; we shall therefore, without hesitation recommend this remedy wherever the necessity exists. I have uniformly however made it a rule where the pulse was tense, and the disease in its commencement, to diminish its vigour by blood-letting from the arm before its exhibition; and in employing the bleeding, I usually recommend the blood to be taken pretty suddenly away, by which means we induce a disposition to *syncope* without a great loss of blood; and if the patient be not too much weakened, to have her bowels opened by an injection. The *acetate of lead* may then be given with freedom and certainty, from three grains to ten every half hour until its object is obtained. It will perhaps surprise when this remedy is recommended in such quantity and in such quick succession, but I have no hesitation in declaring I have not only found it safe in such quantities, but necessary; and with respect to the frequency of its exhibition, I believe if it does not produce the desired effect in half an hour, that that dose will not do it in a longer period. It is always to be combined with a small quantity of opium, a fourth or fifth of a grain will in general be sufficient. I have in some cases found, where opium has disagreed, joining a grain of the powdered *Capsicum*, has been useful; this however is only to be used where the system is prostrated, from the long continuance or excess of the discharge. By employing this remedy we sometimes obtain, if nothing more, an

Of Convulsions, considered particularly with respect to Labour and Delivery.

798. There is no woman who may not be seized with convulsions during pregnancy and labour, the causes of them are so numerous; but there are some women in whom they seem so to depend on that state, that they are repeated every time they become pregnant or are in labour.*

799. In some cases, the convulsions are constitutional, and we know no more of their cause, than of the means of curing them without return. They attack during pregnancy, as in the natural state, and each paroxysm leaves no other consequences than what they did before the woman was pregnant. In other cases, the convulsions are only sympto-

important truce, more especially at the latter periods of pregnancy, and when the *placenta* is not attached over or very near the mouth of the *uterus;* time is given by this means to the *uterus* to dilate, and if farther exigencies require delivery, it is in a better condition for this object. In addition to this I have seen a very alarming hæmorrhagy suppressed, by a stream of cold water let fall from a considerable height on the belly of the patient. It is important where the discharge is serious, to keep the feet and legs warm by flannels, bottles of warm water, &c. I have succeeded frequently in considerable discharges in the early months of pregnancy, by having a strong solution of the *acetate* thrown up the *vagina;* say a drachm to a pint of water.

I have met with some cases where the *sugar of lead* has produced no effect when given by the mouth, and where it has produced an almost instantaneous one, when ℈j, to a gill of cold water with ʒj. of *Tinct. Thebiac* has been given as an enema. W. P. D.

* I never have known them recur a second time in the same woman in subsequent pregnancies, except they were strictly epileptic and constitutional; I do not consider these therefore strictly puerperal convulsions. W. P. D.

matic or accidental, and the remote causes of them are not so impenetrable as those of the former.

800. This species of convulsions may depend on great and sudden emotions of the mind, on a sanguine plethora, or on an excessive flooding, on a fulness of the *primæ viæ*, on an extreme sensibility of the uterine fibres, a violent distention of the edge of the orifice of the *uterus*, and of the parts which form the entrance of the *pudendum*, on a rupture of the body of the *uterus*, and, according to some authors, on the excessive dilatation of the cavity of that *viscus*, which however is not founded on any incontestable fact.

801. As the time of labour is that period of pregnancy when these causes are united in the greatest number, it is also that when women are oftenest seized with convulsions. The uterine fibre is not, in fact, so sensible, nor so irritable, in any period of pregnancy, as in that of labour: those two properties, inherent in the muscular fibre, seem at that time to increase in proportion to the force which the *uterus* must exert to overcome the obstacles which oppose the expulsion of the child. It is the time when the blood is driven with the greatest impetuosity towards the brain, because it is that when the *uterus*, closely embraced by the abdominal muscles, makes the strongest pressure on the inferior *aorta:* it is the time when that fluid is most rarefied, that in which there is the greatest disturbance and agitation in the animal economy, on account of the violence and frequency of the pains, &c. From the state of perturbation which we observe in most women when the force of labour is at its greatest height, especially in a first labour, to a state of convulsions, the passage is short and rapid.

802. The concurrence of all these causes is not necessary to produce convulsions; a single one is sufficient. As all those which I have mentioned may act separately, and at different periods of pregnancy, the woman may be attacked by convulsions at any time of it. There are cases in which the convulsion adds to the cause which produced it, so that a first paroxysm brings on a second, &c. and there are others where the cause seems to be extinguished with its effect, so that the convulsion appears no more.

803. As there are cases where the convulsion is only momentary, so there are others where it becomes periodical, and in which the paroxysm is very long. M. *Levret* mentions a woman in whom this paroxysm was repeated every day at the same hour, and towards the latter end of pregnancy lasted eighteen hours out of four and twenty.* I have delivered one, who suffered convulsions periodically every month, during three successive pregnancies: they seized her at the time when the menses used to appear, and attacked her twelve successive days in each month of the first pregnancy, augmenting at each paroxysm, till they lasted three hours and an half towards the middle of the day, and three hours and an half in the evening. They returned also periodically in the two next pregnancies, but they lasted a shorter time, and were not so strong; because we found the way to calm, and even prevent them.† Convulsions of a different kind were so exactly periodical for four days, in another woman, that there was not a minute's difference in the commencement and duration of each paroxysm.

* Levret, Essai sur l'Abus des Règles générales, &c. p. 15.

† See the note on par. 809.

804. All convulsions are not of the same nature, nor affect the same organs, nor equally disturb the harmony of the functions. Sometimes they present a frightful spectacle; agitating all the muscles, even those reservoirs, or organs, which we look on as so many hollow muscles. At other times, the countenance is tranquil during the paroxysm, and the convulsion affects only the large muscles, as those of the *trunk* and extremities.

805. In the former case, the eye of the spectator can scarcely follow the motion of the woman's eyes, the agitation of the muscles of the face, the neck, the *trunk* and extremities; the jaws are locked, and she grinds her teeth; the mouth is covered with froth, and the nostrils throw it out likewise; respiration is quick, irregular and loud; sometimes also there is an ejection of the urine and *fæces*. A stiffness of the body and limbs succeed this convulsive agitation, and the woman remains immoveable during a longer or shorter time. The respiration, though more tranquil then, continues loud; the face remains swelled and very red; the jugular veins appear very large, and the pulsation of the *carotids* is very strong. Sometimes the understanding does not return for several hours, and even days, after these convulsions; and the loss of memory, sight, and of hearing, continues still longer. I have seen women who had no remembrance of their pregnancy more than a week after the convulsions, having been delivered in one of the fits; in others the light has made no impression on the eye, nor could the ear be affected by any sounds, during three or four days.

806. When the convulsion affects only the muscles which serve for the animal functions, and especially the large muscles, it scarcely causes the

slightest alteration in the woman's countenance. If her colour heightens a little during the paroxysm, she soon grows pale again; if she loses her understanding, it presently returns, or, if it does not return, the state in which she remains after the fit rather resembles natural sleep than that comatose state just mentioned; and when she revives she will often continue the conversation which the convulsion had interrupted.

807. These different species of convulsions are not equally troublesome, nor do they equally disturb the progress of gestation, and the mechanism of labour, nor do they require the same treatment. It is very rare that they do not bring on the pains of labour, at whatever period of pregnancy they happen, when they are of the species described in par. 805; but they bring them on the more certainly, as pregnancy is farther advanced. Whatever method we may take against these convulsions, we cannot save all the women who are seized with them, and some must sink under them. It is not the same with those described in par. 806; they rarely disturb the progress of gestation, or happen in the course of labour, however frequent they may have been before. Delivery took place but fifteen days before the usual time, in the woman who is the subject of M. *Levret's* observation; and in her whom I have mentioned in the note on par. 809, it wanted but three or four days of the period of the tenth revolution of the *menses*, when she was delivered of her first child. Yet the convulsions in the latter were constantly excessively strong; and in several of the paroxysms in which I saw her in the eighth month, the trunk was so bent backward, that her head and feet resting on the bed, touched each other; which was repeated

more than ten times during the paroxysm, and with a rapidity which the eye could not follow.

808. Though convulsions sometimes attack without any precursive symptoms, they are generally preceded by a lassitude and a starting of the limbs, oppression and anxiety, a heaviness or pains in the head, giddiness and singing in the ears, even a sudden blindness and deafness; the mind seems disturbed, and the eye becomes wild, &c. Though these symptoms in some women only denote a nervous affection, or an hysterical state, they are almost always indications of a sanguine plethora; and in either case we may prevent the consequences.

809. In some of these cases, we may usefully employ the warm bath, antispasmodics, and antihysterics, either to prevent or calm the violence of the convulsions: but nothing can supply the place of bleeding in those who have signs of a sanguine plethora, or when the convulsions have caused an *engorgement* of the brain. Authors are not perfectly agreed on the part where we ought to open the vein; some advise bleeding in the foot, others in the neck, but the greater part in the arm: it would be of great importance to fix the opinion of young practitioners on this point. I have seen convulsions of the kind described in par. 805, yield to nothing but bleeding in the neck, after several bleedings in the foot; those mentioned in par. 806, appear after a bleeding in the foot, and be constantly removed by bleeding at the arm.* There are circumstances in which evacu-

* The woman who is the subject of this observation, had convulsions of this species at the instant of a bleeding in the foot, which a suppression of the *menses*, some years before marriage, had seemed to require. Being attacked with convulsions in the first month of pregnancy, eight or ten drops of the mineral anodyne liquor of *Hoffman*, taken in a spoonful

ants are exclusively indicated: but I cannot state them here.*

of orange flower water, rendered the fit longer by half than it had been the evening before; and a similar dose administered the next day, prolonged it as much more: so that from three quarters of an hour, which it was at first, it was lengthened to an hour and three quarters, and afterwards to three hours and an half, both morning and evening; which continued in that manner, during twelve days of each month, till the end of pregnancy; notwithstanding the use of the warm bath four hours each day without interruption; diluting drinks, &c.

The second and third pregnancies would have been equally stormy, had she not been bled at the arm. The convulsions appeared at the same periods, and seemed to follow the same course: but eighteen times taking away a single porringer of blood stopped their progress. If it was deferred twenty-four hours after the first attack in each month, the convulsions became very strong; done at the instant of its commencement, the paroxysm went off; at the time when the precursive symptoms announced it, it was prevented; so that it had constantly the same success, whether it was employed with a curative or a preventive intention.

Bleeding at the arm was not less salutary in the same woman, since the third pregnancy, on account of convulsions proceeding from a suppression of the *menses*. Recourse was not had to it till after the trial of many other methods which had augmented them, and they ceased immediately after that bleeding: it had the same success two following months. The convulsions have not appeared since, the *menses* having been regular.

* I am much pleased with the stress our author lays upon the use of the lancet in this truly formidable disease, as I am well persuaded in nine cases out of ten in this country, it is the only remedy to be depended upon. I cannot agree with him as to the importance of the part from whence the blood is drawn, provided an equal quantity in a given time can be taken. I am persuaded this noble remedy has failed in many instances, and in some done harm, from an inattention to the time employed in drawing the blood; if the orifice be small, and the blood only trickle down, it will almost certainly do harm, by allowing the blood vessels gradually to contract on their contents, and thus fail in diminishing their vigour; it

810. Although the danger which arises from convulsions is as great in many cases, as that which proceeds from an excessive flooding, yet we ought not to endeavour to bring on labour, as in the latter circumstance; because it would not be attended with the same success. Besides that convulsions do not always essentially depend on pregnancy, and that they often have other remote causes, which delivery cannot remove, the efforts necessary to overcome the obstacles which might oppose it, would not fail to aggravate them and render their consequences

should therefore be an invariable rule, to draw the blood from a large orifice, and a large vein; on this account, I have sometimes preferred the jugular, and in others have set two streams going, one from each arm.—I have no doubt but the mischievous effect of bleeding in the foot, as mentioned by our author, may be accounted for in the way we have suggested, and the relief obtained by bleeding from the arm, was entirely owing to the sudden abstraction of the blood.

With respect to the quantity drawn, I have but one rule, bleed as long as the convulsions continue frequent and powerful, and the determination to the head evident, by the swelling and lividity of the face, projection of the eyes, and almost complete suffocation. I have in more instances than one, taken, with the happiest effect, an hundred ounces in a few hours. The first bleeding especially should always be large where the case is violent and threatening: Two important objects are almost always answered in this way, first a cessation or diminution of the convulsions, and secondly, a relaxation of the mouth of the womb, that enables us to turn, if the disease happens just before, or at the commencement of labour.

This remedy, like many others, must be employed promptly, if good be expected from it; it is too late, when effusion has taken place in the brain. I had not long since an opportunity of seeing the head of an unfortunate woman who died from this kind of convulsion. The *longitudinal sinus* of the *dura mater*, was estimated to contain between two and three ounces of blood; the posterior left ventricle was filled with a bloody serum; the rests appeared healthy, as did the other parts of the brain. W. P. D.

still more grievous. I except however those cases where they happen during the course of labour, and at a time when the parts of the woman are already well disposed for the passage of the child. When these natural dispositions do not exist, the violence which must be exerted to solicit the expulsive action of the *uterus*, to dilate its neck, and introduce the hand into it, to turn the child and extract it, would it not be a new cause of convulsions, which would increase the former, as well as the danger resulting from it? Will it be said that we may cut the neck of the *uterus*, in order to penetrate it more easily, as several accoucheurs have practised? This proposition, in such cases, could only pass for the effect of a fit of insanity.

811. Those who have attributed the convulsions to an excessive distention of the uterine fibres in the last periods of pregnancy, of course knew no better mode of calming them, than to perform the delivery; and some have thought that evacuating the waters of the *amnion* would be sufficient to restore and properly relax those same fibres. Without admitting their opinion on the cause of convulsions, I allow that this practice has sometimes had the desired success; that there are really cases where it is proper to evacuate the waters of the *amnion*, others where we ought to extract the child, and even cut the neck of the *uterus:* but those casas are rare, and never are met with before the efforts of Nature have already begun the labour.

812. By attentively observing what passes in cases of convulsions, we remark that they do not always interrupt the course of the labour pains, whether they had excited those pains, or the pains had preceded them. All authors relate examples of women who have been delivered without help after several

fits of strong convulsions, and others while they were actually convulsed, whether there were lucid intervals between, or that the loss of understanding was permanent. The progress of labour in most of these cases seems even more rapid than in others, since we have often found the child between its mother's thighs, though an instant before we could discover no disposition for delivery.

813. The result of these observations is, that we ought not to be in haste to deliver, when Nature seems disposed to perform it herself, whatever may be the nature and force of the convulsions; that we ought never to attempt it in any case, if the labour is not already begun, because Nature, notwithstanding the disorder in her functions, can perform in a short time, what we could not obtain but with abundance of efforts and danger, besides that a calm may be restored, notwithstanding the number of convulsions which have taken place; that while we wait the favourable moment for operating, we should only employ those means which we could use after delivery if the convulsions should continue; lastly, that we may in many cases accuse those practitioners of too much precipitation, who have conducted themselves differently, instead of giving them credit for the success they flatter themselves they have obtained.

814. The convulsions which only happen during labour, having often no other cause than the excess of pain, the extreme sensibility which the fibres of the *uterus* then acquire, the stretching which those of the neck of that *viscus* suffer when it opens with difficulty, as well as the external parts; the volume of the blood, augmented by the heat excited by continued efforts; the *engorgement* of the vessels of the brain, &c. seem to require different aids, and call

for less delay in the delivery. If they continue, with loss of understanding, after a copious bleeding, we may open the membranes, in order to diminish the volume of the *uterus*, relax its fibres, calm the excess of its sensibility and irritability, which are then accidentally excited to that degree; and much more to weaken the pressure which that *viscus* exerts on the inferior *aorta*, and thus recal the blood in greater quantity into the vessels of the *abdomen*, and the lower extremities. If the convulsions subsist with the same force after the administration of these succours, we may perform the delivery, unless it appears disposed to take place speedily.

814. There are cases in which we cannot dispense with turning the child and extracting it by the feet; because it presents in such a manner, that it cannot be born without help, nor be extracted any other way; we ought then to proceed to it immediately after the evacuation of the waters, whether the convulsions subsist or not. There are other cases, where it would be better to extract it with the forceps, if we could procure them in time, and the distance of the head ought not to be a motive for excluding that instrument, except when the hand, obliged to direct it in this pressing circumstance, is not sufficiently experienced. There are some in which the head is so engaged at the time when the danger of deferring delivery appears, that there is no longer any option between those two methods, the application of the forceps being the only one indicated; except when the child is dead, for then we may substitute the crotchet. Lastly, there are some where we are obliged to cut the edge of the orifice of the *uterus*, the fibres of which cannot extend beyond what they have done before, nor tear; whether because they are too dry and too rigid, as

we observe particularly in women advanced in age when they are in labour of their first child,* or because that part of the *uterus* is hard and scirrhous. But these cases are very different from those for which I have rejected even the idea of such an operation.

Of Syncopes, of the Exhaustment of the Woman's Strength, and other Causes stated in Par. 785, *and particularly of the Exit of the Umbilical Cord.*

815. Syncopes, or faintings, if frequently repeated in the course of labour, although we may not be able precisely to determine the cause of them,† as

* M. *Dubosc*, professor in the College of Surgery of Toulouse, communicated to the Royal Academy of Surgery, in 1781, one of the most interesting observations on this subject. We there remark that the preservation of the woman was the fruit of the section of the edge of the orifice of the *uterus*. This woman, being about forty years old, and big of her first child, had been in strong labour three days, and suffered convulsions from the second; her person could not be known, says M. *Dubosc*, and was frightfully pale; her pulse weak and almost extinct, as well as her voice; her eyes, hollow and dull, appeared dying, a clammy sweat covered her whole body, and her extremities were cold; she was senseless, and could not swallow a single drop; the edge of the orifice of the *uterus*, open the breadth of a crown, was hard, tight, and in a manner callous. Delivery was performed spontaneously three or four minutes after the section of that part: the child was dead, but the mother immediately grew calm, and the subsequent symptoms were mild.

† One of those women who were delivered in my theatre, for the instruction of my pupils, in 1774, after violent convulsive agitations on the part of her child, at the beginning of labour, suffered frequent faintings, followed by an abundant

well as a general weakness or exhaustment, which deprives the woman of the power of exerting sufficient efforts to expel the child, ought to engage us to deliver her, in order to prevent consequences often very disagreeable.

816. That procedure is a thousand times preferable to the useless attempts which are made to quicken lingering pains, after a labour so long and so severe, that the *uterus* scarcely retains the power of contracting, or is in a state more or less disposed to inflammation.

817. An irreducible hernia sometimes obliges us to deliver, as the efforts of labour may force more of the intestine down, and thus become strangulated.*

818. The obliquity of the *uterus* alone, rarely obliges us to deliver, as the bad direction of the *uterus* is easily obviated. The young practitioner's

vomiting and a copious *diarrhœa*, for two hours; and died about fifteen hours afterwards, in a third paroxysm of *syncopes*, before she was delivered. On opening her body, we found a stone, of the size of a small walnut, in the gall-bladder; and the *omentum* collected in the form of a cord, strongly adhering to the inferior and right lateral part of the *uterus*, so that the stomach and the arch of the *colon* were dragged by it in a singular manner.

* I was a witness of the fatal consequences of such an accident, towards the middle of November 1774. A loop of intestine, in the efforts of labour, had insinuated itself through a mass of the *omentum*, about the size of a hen's egg, which for nine years had formed an umbilical hernia, and was there strangulated. The woman already suffered the symptoms of strangulation, when I was called; and those symptoms, much more than the apparent impossibility of her being delivered alone, determined me to deliver her. But we could not effect the reduction, not of the *omentum*, which had always appeared irreducible, but of the portion of intestine newly come out, and it was not thought proper to attempt the operation; so that the woman died the third day after delivery.

attention should however be directed to this condition of the *uterus*, we therefore recommend him to the chapter on this subject.

819. Still more rarely does the contraction of the neck of the *uterus* on that of the child, render delivery impossible without help. The circle which constitutes the internal orifice more frequently contracts than the external circle; we can do but little in these cases, as the hand cannot pass the head of the child, when the latter is in the *pelvis*, to dilate the neck, nor can we without great inconvenience push the head back to search for the feet; and if the forceps are applied, the shoulders will pass with great difficulty. When it is the internal orifice that contracts, the inconveniences are not so great, as the head has not descended so low, and may always be pushed back, and which allows the hand to pass under the uterine circle, to dilate it.*

820. The exit of the umbilical cord, brought along by the current of the waters at the time the membranes open, has always been considered as an accident very dangerous to the child; as well on account of the contact of the air, which cools the

* I have been a witness of this circumstance but once; but I could quote several examples, which persons capable of forming a good judgment have communicated to me. The opening of the body of the woman, in some of these cases, has demonstrated that the contraction of the neck of the *uterus* alone obstructed delivery. In that case of which I was a witness, the child's head had occupied the bottom of the *pelvis* for sixty hours; it had been crushed with the forceps, and the crotchet, which was used afterwards, had only brought away some pieces of it. Instructed by the examples which had been communicated to me, and finding the volume of the head sufficiently diminished, I advanced my hand by the side of the base of the *cranium*, to dilate the neck of the *uterus;* I then turned the body of the child, and brought down the feet.

cord, and diminishes the motion of the blood in it; as of the compression which afterwards intercepts the course of that fluid through it.*

821. This accident is, without doubt, dangerous; but the precept of delivering instantly, by turning the child, would not be less so, if we were to give it indiscriminately for all cases where the cord falls down thus: for many a child has perished while it was extracted by the feet, which might have been born living, notwithstanding the exit of the cord, if the delivery had been left to Nature.

822. We ought then to attempt nothing till we have well examined the course Nature is likely to take, and the effects the umbilical cord suffers; for often, after the discharge of the waters, which brought it out, the expulsion of the child is quicker than its extraction could be; by following the too general precept we should, in all those cases, add a long compression of the cord, to the danger sometimes inseparable from turning the child, and bringing it by the feet.

823. The umbilical cord is not always so much compressed as to destroy the circulation in it when it is down; therefore, as long as the pulsation is free, and the child's head engages easily, we ought to wait, as the delivery will either soon terminate, or the head will descend so low as easily to be extracted with the forceps; these are to be preferred to turning, if they are at hand.

824. The danger to the child when the end is prolapsed, is increased by a narrow *pelvis*, as the

* This opinion I do not think sufficiently well founded, as I met with a case where the pulsation continued in the cord six hours and a half after the birth of the child. See Med. Museum, vol. ii. part 2. page 140. W. P. D.

cord now must suffer more compression; and the death of the child is almost certain let us employ what means we may.

825. The exit of the umbilical cord presents no particular indication when it is cold, without pulsation, or putrid: the child being already dead, we must leave its expulsion to Nature; the cord alone cannot oppose it, though it form a loop without.

826. It is generally supposed that the cord by its shortness, or frequent windings on the child, opposes considerable obstacles to delivering; such as keeping the head back, or if it allows it to advance during pain, it makes it recede immediately after; thus mistaking the reaction of the *perinæum*, and bones of the *cranium*, for the action of the cord. This will point out the futility of the advice of some authors who recommend the cutting of the cord, &c. the more especially, as we cannot determine the length of the cord before the exit of the child, nor can we determine that it is twisted round the child's neck, until the head is delivered.

Of the Signs, in general, which show that a Labour will be preternatural; of the Indications presented by that Kind of Labour; and some general precepts relative to it. Signs and curative Indications.

827. A Preternatural labour begins with pains, whose cause, progress, and effect, are no way different from those of the most natural labour. The signs which characterize it, are deduced from accidents which complicate the labour, from the situation of the child, and from the existence of some of the causes already mentioned.

828. We may easily distinguish the cases in which the woman suffers a flooding, convulsions or any other accident, from those which are not complicated with any of those circumstances: but it is by touching only we can discover the situation of the child. Though we sometimes acquire this knowledge without any trouble, even before the membranes are open; at other times we cannot without a great deal of difficulty, as we shall see in the sequel.

829. These labours present general and particular indications. The former consist in turning the child to bring it by the feet; in changing some positions of the head, in order to procure a better; in correcting the bad course it sometimes takes, as it engages in the *pelvis*, or merely in pushing back an extremity, whose presence hinders it from advancing: but the particular indications are different, according to the situation of the child, the part it presents at the entrance of the *pelvis*, and the circumstances which determine us to operate.

Of the proper Situation for the Woman in a preternatural Labour.

830. The situation of the woman, in this case, as in all others, is not very important before the time of delivering, unless particular circumstances oblige us to prescribe one rather than another; but it is very different at the time when we must operate.

831. The woman must then be laid on the back, and as horizontally as possible, the breech being placed at the edge of the bed, so that the *coccyx*

and *perinæum* may be free, the thighs and legs half extended, and the feet resting on two chairs placed properly, or supported by assistants.

832. A common bedstead is preferable in these cases to the *lit de sangles*, which is generally used in natural labours. We ought likewise to prefer one of a moderate breadth, and take care that it be not mounted on castors; as well for the security of the woman, as for the convenience of the accoucheur and his assistants. This bedstead should be furnished with several mattresses,* and a solid cushion put under their extremity, to prevent the breech from sinking in, and make it more steady; the end of the bed may be covered with some folded sheets, and some pillows must be placed towards the middle.

833. The woman being laid according to the directions in par. 831, must be covered with a sheet, and even a blanket, if the season require it, to defend her from the cold, and prevent her being exposed naked to the eyes of the assistants; and also of the accoucheur, to whom, in these cases, the touch is much more useful than the sight. Two assistants, with one hand applied to the knees, and the other to the feet, must fix the inferior extremities, and separate the thighs properly; a third, if necessary, may be placed behind the shoulders, to keep her firm, and prevent her from sliding down, while a fourth furnishes every thing occasion may require.

* These are certainly unnecessary, one is often convenient but not indispensable. W. P. D.

General Precepts relative to Preternatural Labour.

834. When we have but imperfectly discovered the situation of the child at the orifice of the *uterus*, if the absence of the signs which denote the presence of the head gives suspicion that the situation is not favourable, we must wait till the opening of the membranes, to dissipate our doubts, and acquire a certainty concerning it.

835. Before that epoch, nothing invites us to terminate a labour which the bad position of the child renders preternatural, unless the woman be attacked by some of those dangerous accidents already mentioned: when that happens, all long delay is contrary to the principles of sound practice; but the consequences which may result from immediate delivery, sometimes oblige us to defer it awhile, in order to attend to the particular and pressing indications which they prescribe.

836. If there is reason to fear plunging the *uterus* into a state of atony, by delivering as soon as we have discovered the bad situation of the child; if the force necessary to be exerted in opening the neck of the *uterus*, to turn the child before the instant prescribed, is equally alarming; an *engorgement*, and inflammation of the *uterus*, which may be the consequence of the useless efforts to which it is sometimes abandoned after the evacuation of the waters, will not seem less to be dreaded.

837. Therefore the most favourable moment for operating is that of the greatest dilatation of the neck of the *uterus*, and of the spontaneous opening of the membranes when it takes place in proper

time. We ought to wait for that time when we are called before it; but when we are called much later, we must operate immediately, unless the inflammatory state of the *uterus* forbid it: for then it is necessary, before every thing, to take off the tension of that *viscus*, and diminish the *engorgement* of its vessels.

838. The case where the accoucheur is called some time after the spontaneous opening of the membranes, is not the only one in which he cannot take advantage of the most favourable moment for turning the child; for often at that moment the labour presents with the fairest appearances, and the accidents which ought to determine us to operate, do not manifest themselves till later. In this case, indeed, the child's head almost always presenting, descends more or less into the lower part of the *pelvis*, and may be easily extracted with the forceps, so that the labour differs little from a natural one.

839. We are also forced to let slip the moment which would, in some respects, have been the most favourable for turning the child, when the membranes burst at the beginning of labour, and before the neck of the *uterus* is sufficiently relaxed and open for the admission of the hand.

840. Bleeding, emollient and mucilaginous injections, baths, and moist fumigations, joined to dilatations methodically performed with the fingers, are sometimes very useful in such cases, for weakening the rigidity of the neck of the *uterus*, and facilitating its opening.*

841. As soon as the favourable moment for operating shall be indicated, whether by the nature of

* I believe we shall rarely find it necessary to employ any of the other remedies prescribed in this paragraph, if we indulge sufficiently in the use of the lancet. W. P. D.

the circumstances, or the state of the labour, the accoucheur having prepared himself for it, must place the woman in the situation prescribed in par. 831.

842. When it is necessary to introduce the hand into the *uterus*, to perform the delivery, some practitioners are still in the habit of putting on an apron, baring their arms, and even putting on false sleeves, &c.; but these precautions, most of them useless, always strike the woman with terror, and a less frighful apparatus has often thrown them into a state of anxiety and disorder, difficult to remove.

843. If it is necessary to uncover the arms to turn the child, it is proper to do it no farther than the arm penetrates into the *uterus*. Some cloths, laid on one of the chairs which support the woman's feet, will serve the accoucheur to guard himself from the blood and waters which drain from the *uterus;* and to wipe his hand every time he withdraws it, that it may not be exposed bloody to the eyes of the woman and assistants.

844. The operator should always proceed cooly, and appear tranquil, even in the most desperate cases, that he may not augment the fears of the woman to whom the smallest embarrassment, the most trifling motion, or gesture, are then as so many mouths which seem to her to announce her destruction.

845. Before we introduce the hand, it ought to be dipped in some mucilage, or anointed with butter, or any other fat substance, that it may pass more easily, and with less pain. This precaution may likewise sometimes be very useful to the accoucheur.

846. In all cases we ought to act slowly, move the hand little, and choose the favourable moment for advancing it. When the external parts of the

woman are tight, the fingers must be introduced successively, so that the first, by dilating a little, may prepare the way for the others. We should choose the time of a pain for advancing the hand in the *vagina*, it is of great importance to act only during the latter, when we insinuate it into the *uterus*, and afterwards not to move it at all during the pain; because the sides of that *viscus*, then embracing the child more strongly, and being more stretched, give a greater resistance, and are more subject to be torn.

848. We cannot act with too much slowness, and circumspection, in dilating the neck of the *uterus*, when it continues thick, and is not very supple, least we tear it from its junction with the *vagina*, in which part almost the whole action of any considerable efforts would centre.

849. After the hand has cleared the entrance of the *uterus*, we are often obliged to withdraw it many times, before we can reach the child's feet, especially if we do not proceed methodically; because it is so compressed by the action of that *viscus*, or the pain, that it is benumbed, or suffers such painful cramps, that it loses all power of acting.

850. During the whole time that we are introducing the hand, and turning the child, the other hand should be applied externally, above the *fundus* of the *uterus*, to fix it, or change its direction occasionally, and to make certain pressures, which circumstances, more difficult to determine here, than to perceive while we are acting, render sometimes necessary.

851. The two hands are not always equally convenient for finding the feet of the child, and turning it: if there are cases where we may use either

indifferently, there are many more which require one of them, and not the other. The choice depends on the particular situation of the child; and on that choice often depends the facility of the operation, and even its success.

852. The direction which the hand must follow, the position it must preserve as it advances in the *uterus*, and the extent of surface it goes over, must also be varied according to the situation of the child, and the part which it presents; so that we can give here none but very general rules on the subject.

853. We ought always to insinuate the hand at the part most easy and certain for finding the child's feet. Sometimes it is along one of the sides of the *uterus*, but much oftener along its back part; and hardly ever between its fore part and the child.

854. When it is necessary to turn the child, the feet must always be brought down on its anterior surface; in order to bend the *trunk* more and more in the same direction, and make it describe a smaller arch in the *uterus*. We ought never to pull the extremities in such a manner as to bend the child backwards, or subject the spine to any dangerous flexions, or contortions.

855. Although we might, in many cases, where we turn the child, extract it by one foot, it is always better to take them both; because it will then come along more easily. Besides, in some cases, this precaution is so necessary, that without it we should sooner tear off the leg than bring the child along. It is indeed often difficult to bring down both extremities at the same time, because, being slippery with glaire and blood, as well as the hand which operates, it is not easy to grasp them together, and one of them is very apt to slip from the fingers. In that case, after having brought one of the feet to

the entrance of the *vagina*, we must keep it there by means of a fillet, while we search for the other.

856. We ought never to attempt turning the child during a pain, because it is then more confined in the *uterus;* but when the feet are without, and the head is sufficiently removed from the superior *strait*, when it presented there at first, we ought, as much as possible, to wait for a pain to extract it. The woman also ought to suspend her efforts while the accoucheur is employed in turning the child, but she cannot bear down too much while he extracts it.

857. Some accoucheurs would have us indiscriminately abandon the expulsion of the child to the efforts of Nature, after having brought the feet to the orifice of the *vagina;* but the child not being then entirely turned, those efforts would become useless, and sometimes dangerous. If we would follow this precept, we ought at least to bring the child's breech to the passage: otherwise, far from obviating the inconveniences which it is pretended we should by that means avoid, we should often only expose the child to greater. The cases, in which we might follow this precept with the least danger, are precisely those in which we might finish the extraction of the child without any risk, by pulling at the parts already delivered.

858. This operation ought never to be performed precipitately, nor must the extremities of the child be pulled by jerks; but always in a slow and continued manner, especially when the waters of the *amnion* are but lately evacuated: in order to prevent the effects of a too sudden depletion of the *uterus*, and to hurt the parts less on which we act.

859. The danger to which the mother and child are exposed in preternatural labour, is always rela-

tive to the kind, and the violence of the accident which renders it so; as well as to other circumstances which must be deduced from the time when the waters were evacuated, that in which we operate, the more or less bad situation of the child, &c.

860. When we have discovered that the labour will be difficult or preternatural, whether on account of the bad situation of the child, or any other accident, we ought to advise the woman's relations of it, and acquaint them of all the difficulties and the danger, if any exist, in order to avoid the blame which they think they have a right to throw on us, in case of a disagreeable event. But we should be more reserved with respect to the woman, lest we frighten her, and increase her danger: except when religion requires us to inform her of it.

Of the general Indications, in those Labours where the Child presents the Feet.

861. When the labour is not complicated with any troublesome accident, we ought to observe the same conduct, with respect to the woman, till the membranes open, as if the child presented the head: but at that epoch we are to disengage the feet, if we can, by means of two fingers introduced into the *vagina*, that we may avoid the difficulties stated in par. 524 and 864; or at least direct them in such a manner that they may not be stopped against any part of the *pelvis*, during their descent.

862. When the feet are without we must assist by gently pulling at them, more especially if the woman be weak: in the latter case we cannot wait many times for the feet to come down spontane-

ously, but are obliged to take hold of them at the orifice of the *uterus*, and deliver the child immediately. Besides the causes we have enumerated (from par. 785 to 826) may render these labours, preternatural, we may add the manner in which the feet present and advance. We have reduced these in four principal ones.

863. One foot frequently presents, and advances in the *vagina*, while the other is so situated as completely to oppose the exit of the child. It is not always necessary to bring down this second extremity; it however in general is best to do it; and indispensable when it would require much force on the protruded extremity to make the body descend. To prevent accidents to the joints and bones of the leg, we should when we pull at a single extremity do it in such a direction as will carry the whole limb towards its companion, if it were also disengaged. And to divide the force as much as possible, we should hook the groin as soon as the breech is low enough. When the breech is without it must be grasped with both hands, placed as high as the hips, and the *trunk* brought along till the second foot comes down.

864. When we wish to search for the second foot, we should retain the one already down, either by the hand or fillet. When the breech descends with both feet, it is sometimes difficult to disengage them, as the *pelvis* is not sufficiently large to allow all these parts to pass together. This may be prevented by bringing down the feet before the breech is engaged in the *pelvis*, and overcome when it exists, by pushing up the breech above the superior *strait*, before we attempt to pull down the feet.

865. It is often necessary to search for the second foot, when the child presents but one; it is not less

proper, when we meet with three, or four, to distinguish the two which belong to the same child, that we may not risk bringing down twins at the same time. We ought to use the same precaution when we find but two feet at the orifice of the *uterus*, because it is possible that each twin may present one.*

866. When we are obliged to advance the hand to the orifice of the *uterus* to take hold of the feet, we must do it as we can, passing the fore-finger between them, and grasp them closely with the others. They are then to be wrapped in a soft dry cloth, as soon as they are without, that they may be held more easily, and firmly; being very slippery with the greasy *mucus* which always covers them. After that we bring the breech to the passage by pulling obliquely downwards.

867. We then apply the hands above the knees, to ease the joints of the feet and legs; and, in order to spare those of the thighs, as soon as the hips are without, we take hold of them.

868. But we ought never to apply the hands to the belly and breast of the child, with a view of acting nearer to the parts retained, for in doing that we might impede or stop the motion of the heart; we might likewise compress and bruise the liver, which is very large and very tender at that epoch: and nothing could be of more dangerous consequence. It is the hips only that we ought to handle, till the shoulders are without.

869. When we have brought down both feet, the child descends easily, till the *axillæ* arrive at the superior *strait;* because the inferior extremities and the *trunk*, so far, form a long and pretty regular

* See the article on twins.

wedge. After that, its course becomes slower and more difficult, from the projection of the shoulders, and the obstacles the arms meet with, in rising towards the sides of the head: which obliges the accoucheur to exert more force to bring it along.

870. We cannot, in general, extract the child too slowly, in order that the woman's parts may be dilated more gradually, and with less pain. We ought likewise to take care that the force exerted act in the direction of the axis of the *pelvis*. A slow continued traction, directed alternately upward and downward, but so as to cut the inferior *strait* of the *pelvis* obliquely, is preferable to all the more complex motions.

871. When we are forced to deliver by the feet, the umbilical cord does not always descend in the same proportion as the child's *trunk*, on which we immediately act. It can be drawn down only by that; but first, it is very much stretched, and the *umbilicus* is in danger of being torn, if the cord be retained ever so little above the *pelvis*. To prevent that rupture, the consequences of which might be very troublesome, we must not forget, as soon as the breech appears, to insinuate two fingers along the child's belly, and taking hold of the umbilical cord, pull down a loop of it, longer or shorter, according to circumstances; we must repeat the same thing from time to time, as the *trunk* descends. In this kind of labour, the cord is also sometimes found between the child's thighs, which may expose the *umbilicus* to the same danger of tearing: it must then be relaxed by pulling down that portion of it which ascends along the child's back, and, if we can, enough to slide it over one side of the breech; we may then pass one of the legs through it, and place it by the side of the child.

872. If the cord be so tight, that we cannot bring down any part of it, whether because it is twisted round the child's neck, or from any other cause, it is better to cut it, and just squeeze the two ends a little with the extremities of the fingers, without tying them, than to pull the child in that tense state of the cord.

873. As soon as the *axillæ* appear at the *vulva*, we ought to bring down the child's arms. The cases where we might dispense with bringing them down, are always those in which it is most easy to do it; the mother's *pelvis* being then very large relatively to the size of the head. But when that favourable proportion does not exist, it is of the utmost consequence to follow the method I propose, because the arms can only add to the relative size of the head, and render its exit more laborious.

874. In disengaging the child's arms, we must always bring them down on the fore part of the breast, by making the elbow follow the same course which it seems to have done in ascending to the side of the head. We ought to begin with the arm which is underneath, because it is commonly less compressed than that which is behind the *pubes*.

875. Before we bring down the first arm, we raise the child's *trunk*, wrapped in a napkin, and supported by one hand, obliquely towards one of the woman's groins, while with the other hand we act in the following manner. We first bring down the shoulder as much as we can, in a line with the body, by taking hold of it with the thumb, and fore and middle fingers. Afterwards we insinuate one or both of those fingers into the *vagina*, along the arm, and posterior part of the child's neck, as far as the bend of the elbow, on which we rest the fingers, to bring it down towards the breast, and disengage it.

876. That extremity must be wrapped in the same cloth which is round the child; the body is then to be carried downwards, towards the point diametrically opposite to that where it had been raised before, and supported by the hand which disengaged the first arm, while with the other we bring down the second, observing the same rules as before.

877. The obstacles which may, and often do oppose the bringing down the arms, sometimes arise from forgetting some of the principles I have just stated; and sometimes, because the head being too high, or too low, strongly presses the arms against the internal edge of the superior or inferior *strait*. These difficulties may likewise depend on one of the arms descending directly behind the *symphysis* of the *pubes*, or because it is crossed over the back of the child's neck.

878. The obstacles which proceed from no other cause than the omission of some of the precautions I have recommended, may be easily surmounted by recollecting them seasonably; but it is not so in the other cases. When the head is still so high, that the shoulders scarcely appear at the entrance of the *vagina*, we must bring it down farther, if it can be done without endangering the child's life: otherwise, the arms must be brought down first; which we may always be able to do, however difficult it may seem, by proceeding slowly and methodically. But when the head is too low, and presses the arms against the edge of the inferior *strait*, it must be pushed up a little, that they may be less confined.

879. If one of the arms be found strongly pressed between the child's head, and the *symphysis* of the *pubes*, we must also push the head back a little, in order to free the arm, and enable us to make it pass towards that side of the *pelvis*, to which the face

answers. When one of the arms crosses the child's neck, we must act in the same manner, but bring the other arm down first.—See par. 913, and following.

880. After having disengaged the arms, we must apply to the extraction of the head; and whether it remain awhile in the *pelvis*, when that is ever so little contracted, or we endeavour to extract it immediately, by pulling at the *trunk* and shoulders, this seems to be the most critical and dangerous moment for the child:* on one side it is exposed to the disagreeable consequences of a compression of the cord, and on the other to the melancholy effects of an extension and stretching of the spinal marrow.

881. Some practitioners, with a view of preserving the child, have advised leaving the expulsion of the head to the efforts of Nature; while others have thought, when once it is in the cavity of the *pelvis*, we cannot extract it too quickly: both opinions may be equally dangerous.

882. When the *pelvis* of the woman and the head of the child are in their just proportions to each other, the accoucheur must only act in concert with the efforts of Nature; but before all things, he must take care to give the head a favourable situation, if it has not taken it of itself: he must place the face

* It must be allowed, however, that its death would not be so sudden in this case, as in that where the breast occupies the whole length of the canal of the *pelvis*, supposing the umbilical cord to suffer the same degree of compression; because it may respire when the head fills the cavity of the *pelvis*, if we take care to direct the mouth towards the *vulva*, as I have convinced myself a number of times: which may allow us to wait for the expulsive pains with less inconvenience. But in the other case, as it cannot respire, it must die presently, if the compression on the cord be strong enough to stop the circulation in it.

on one side, if the head be still above the superior *strait;* and underneath when it occupies the cavity of the *pelvis.*

883. He must afterwards introduce a finger into the child's mouth, but much less for the sake of pulling on the lower jaw, than to make the chin form a continued plane with the breast, and hinder it from hitching on any part of the *pelvis.* He must support the *trunk* with the same hand, and the fore arm, while with the other, placed on the child's back, he grasps the hind part of the neck, by means of the fore and middle fingers bent over the shoulders.

884. While the head is still above the superior *strait*, we ought to pull almost directly downwards to make it descend; but cautiously, and only during the efforts of the woman, which we must then solicit briskly, by confirming her hopes of a speedy deliverance. When the head is descended into the cavity of the *pelvis*, and the face is towards the *sacrum*, if we continue our efforts to extract it, it must only be by raising the child's body towards the *pubes* of the mother: for by pulling in any other direction, and especially downwards, we should directly oppose the intentions of nature. The delivery of the head becomes then almost entirely her work; and external efforts, though well directed, are at that time of little use.

885. Things do not however always terminate so happily, in the last period of labour, when the child comes by the feet; because the proportion between the dimensions of the head, and of the *pelvis*, is not always so favourable. When there is a defect of proportion between those parts, the greater that defect is, the less the security for the child's life; and the more cautiously the accoucheur must pro-

ceed, because his efforts, which are then unfortunately necessary, increase the real and almost inevitable danger of the child.

886. Its death in this case is almost always less the effect of the compression of the head, than of the umbilical cord and the breast: but it depends more especially on the straining which the spinal marrow suffers, in the violent extensions of the vertebral column; as well as on the compression, and even tearing, of that medullary substance; because external efforts cannot act on the head, till they have violently stretched, and dragged the neck. A method by which we might act immediately, and as it were exclusively on the head, would be much less dangerous, and more useful. *Smellie* seems first to have perceived this important truth, and he put it in practice several times with success; since we read in his collection of cases, that he obtained advantages from the forceps, in the unhappy circumstance in question, which he would have sought in vain any other way.

Of the different Species of Labour, in which the Child presents the Feet.

887. I SHALL not repeat here what has been said in par. 520 concerning the distinguishing signs of the first species of labour, in which the child presents the feet. I shall only remark that no other presents fewer particular indications; because the situation of the child is such, that the greatest diameter of the breech, of the shoulders, and the head, successively present themselves diagonally at the en-

trance of the *pelvis*, if the accoucheur takes care to maintain those parts in their primitive direction.

888. In this species of labour, as in the others, we are to endeavour to disengage the feet, by introducing one or two fingers into the *vagina*, as soon as the membranes open; and if we cannot, we must be contented to direct them properly, and wait till they be sufficiently descended, to be grasped by those fingers, and brought without. But when the woman is attacked by any dangerous accidents, we must introduce the whole hand, and take hold of them at the entrance of the *uterus*.

889. When the breech is without, we ought to insinuate the fore and middle fingers of the left hand along the child's belly, to examine the state of the *umbilicus*, and if it be threatened with a rupture, relax it, by bringing down the cord, as directed in par. 871, and following. We then wrap all the parts without in a dry cloth, and grasp the right hip of the child with the right hand, and the left hip with the other, and pull obliquely downwards till we meet with some difficulty; our efforts must then be directed differently, and the hands only act alternately in the following manner.

890. With the right hand we pull the right hip, by raising all the parts already without towards the right groin of the woman; and then do the same with the left, by carrying them obliquely downwards, in a line which would pass under the woman's left thigh. The same thing must be repeated alternately, but very slowly; and care must be taken to give those motions sufficient extent, to disengage each time a portion of the *trunk*.

891. When it is time to bring down the child's arms, we must raise the *trunk* obliquely towards the woman's right groin, where it must be support-

ed by the left hand, while with the other we bring down the right arm, which is underneath, according to the principles already established: then wrapping it in the same cloth with the *trunk*, we must carry the whole downwards, and towards the woman's left thigh; where it must be supported by the right hand, while with the left we disengage the other arm from under the *pubes*.

892. The second species of labour where the child presents the feet. The situation of the child with respect to the *pelvis* will appear the same in both, if we only consider their relative dimensions. The only difference we observe in them is, that in the first species, the child's back answers to the left side of the mother, and in the second to the right.

893. After the arms are brought down, we examine the situation of the face at the superior *strait;* if it be not to one side of it we place it there, or if it be descended in the *pelvis* we assist in turning it downwards; we then proceed as already directed.

894. We proceed in this species of labour as with the one just described, except the change of hands, and the direction given to the child's body; what the left hand did in the other, the right does here, and *vice versa;* the same may be said of the direction the child's body is to be moved in, the left groin in this answers to the right in the other, &c.

895. The position of the feet which constitutes the third species of this kind of labour, is rather rare; and it would be far from being so favourable as the two former, if the child did not usually, as I may say, turn of itself, in proportion as it descends, and change insensibly to one of them.—See par. 562 and following.

896. We cannot too early make the child's *trunk* take that direction, when it presents with the heels

to the *pubes*, and the toes towards the *sacrum*, if Nature does not do it herself; in order to turn the face in time from over the *sacro-vertebral* projection, and hinder the head from presenting its greatest length, parallel to the smallest diameter of the superior *strait*.

897. We must not, however, judge of the true situation of the head, relatively to the superior *strait*, by the position we have given to the *trunk*, nor of the position of the *trunk*, by that of the feet: for we should very often be deceived, to the disadvantage of the child, it being possible for the face to be on one side, while the breast is underneath, and the feet in some other direction; and *vice versa*.

898. As soon as the feet are without, the toes are to be directed towards the right or left side of the *pelvis*, and a little downwards, to bring them to the first, or second position. The breast must be turned the same way, in proportion as the *trunk* descends; and when the shoulders are sufficiently low, we must assure ourselves of the position of the head by introducing the finger along the neck, and examining whether the face has undergone the same change of position, and whether it be turned towards the side to which we have directed the breast.

899. If the brim be a little contracted from the *pubes* to the *sacrum*, it would be better to keep the child's *trunk* in its primitive position, that is to say, to bring down the back directly behind the *pubes;* we ought even to bring it to that position, if it were in one of the two former, because it would descend more easily. But then, as soon as the shoulders have cleared the superior *strait*, we must not forget to turn the face to one side, by advancing several fingers on one of the child's cheeks, and not by turning the *trunk* on its axis.

900. If the head should be jambed with its greatest length between the *pubes* and *sacrum*, either by the efforts of nature, or the ill-directed manœuvres of a midwife, or unskilful accoucheur, the child rarely lives, even when proper assistance is called, so much injury has previously been done.

901. When the head is thus retained in the superior *strait*, it must be disengaged by pushing it up a little; and afterwards turning the face to one side. We ought never to expect this change of position from any efforts which can be exerted on the *trunk* without, by turning it one way or other on its axis, or by pushing it back, or otherwise; for all these movements are so much the more free, and succeed so much the less, as the child's neck has been more stretched. Besides, the efforts which we exert on the *trunk*, do not always act on the head, unless we give to those movements a much greater extent than their natural limits permit; which would be extremely dangerous to the child, if it were still alive.

902. To change the situation of the head certainly and properly, we must begin by bringing down the child's arms with all possible caution.* We then introduce the hand, or some of the fingers only, into the *vagina*, to push up the *occiput* ever so little above the *pubes;* and to turn the forehead from before the *sacro-vertebral* angle, and place it opposite one of the *sacro-iliac symphyses;* but preferably towards the right. After that, we go on to extract the head as in the most common cases.

903. This situation of the child, in the fourth

* This refers not only to being careful to do no injury to the arms, but also, not to draw too powerfully at them, and thus jamb the head still more. W. P. D.

species of labour where it presents the feet, is such, that the face always comes upwards; and though it generally turns a little away from the *symphysis* of the *pubes*, as the head approaches the superior *strait*, it never fails to place itself under it, as soon as the head descends into the cavity of the *pelvis:* which renders the labour more difficult and laborious, than in the three former species.

904. It is generally recommended in this fourth presentation of the feet, to turn the face completely downward by rolling the trunk on its axis as soon as the hips are without, with a view to prevent the child's hitching on the *pubes*, if this were even obeyed before the head had cleared the superior *strait*, we should run an equal risk of making the chin hitch backwards, or at least we should make the head engage with its greatest length, parallel with the smallest diameter of the upper *strait.*

905. It has been advised by others to merely turn the face to one side, or towards one of the *sacro-iliac symphyses;* but as the head does not obey the motions executed on the *trunk*, the face would almost always be left over the *pubes.*

906. In order to lay down more clearly the mode of proceeding in this case, I shall distinguish three times in it. In the first, the child's feet are still within the *uterus;* in the second, the child is delivered as far as the loins, and the waters have been drained off a considerable time; in the third, the shoulders are without, or appear at the *vulva*, and the head is adapted to the superior *strait.*

907. In the first time, as soon as the accoucheur can with one hand take hold of the child's feet, he ought to turn the toes underneath, pulling almost directly downward. He must take care afterwards to turn the breast in proportion as it descends, at

least, opposite one of the *sacro-iliac symphyses*, but preferably before the right; and do the same with respect to the face, as soon as the shoulders appear. This change of position is easily performed in the first time, but not so in the second; because the shoulders and head being more closely embraced by the *uterus*, follow more difficultly, and imperfectly, the movements given to the parts without.

908. In the conversion, which the child must be made to undergo in the second time, regard must be had to the relation which the breast has to the *sacro-iliac symphyses*, in order to turn it towards that which it is nearest to. To perform this change of position, we must take care to grasp the child's *trunk*, as near as possible to the entrance of the *uterus*, and not to act but in the interval of the pains. In order to do it in the most convenient manner, especially when we meet with any difficulty, we introduce the four fingers of each hand at the entrance of the *vagina*, or even a little farther; those of one hand along the loins, and the other to the belly; consequently to the *sacrum* and *pubes* of the mother. We first endeavour to push up the *trunk* a little, and immediately afterwards bring it down again as far as before, or a little farther each time: these movements are to be repeated a good many times successively, and in the course of them the breast must be inclined towards the *sacro-iliac symphyses*, to which we intend to turn the face. We ought indeed to turn it a little beyond the *symphysis*, according to the advice of *Smellie*, and then bring it back again; in order to allow for the natural mobility of the neck, and the twist it is susceptible of, without losing sight of the observation made in par. 901.

909. Notwithstanding all these precautions, we must not flatter ourselves that we shall always be

able to make the head take the favourable position which we endeavour to give it: for sometimes the face still remains over the *pubes*. This case is exceedingly dangerous for the child, if we do not pay the greatest attention to it before we pull the *trunk*, on account of the violent twist in the neck. Therefore, after having turned the breast downward, as I have just directed, we must ascertain the true position of the head.

910. It almost always happens, when we turn the child's *trunk* thus round its axis, that one of the arms places itself obliquely behind the neck, and below the *occiput*, by which it afterwards becomes more or less confined against one of the *ossa pubis:* which increases the difficulty of bringing it down, and often renders the descent of the head more laborious. When the accoucheur has not succeeded in turning the face in proper time from over the *pubes*, if he perceives it when the head is but just arrived at the brim, he may yet hope to change its position, by conducting himself as I have just recommended: but he must not promise himself any thing from this mode of proceeding, when an ignorant person has pulled inconsiderately at the *trunk*, with a design to extract the head thus retained, or when Nature has a long time endeavoured to expel it.

911. It is exceedingly rare in these cases for the chin to be retained, and, as it were, hitched on the edge of the *ossa pubis;* it is almost always the middle of the face, near the root of the nose; and the head being then engaged, makes it much more difficult to change its position. The same remark is equally applicable to the third position, when the face descends directly before the projection of the *sacrum;* for it is not usually the chin which stops at that part.

912. The child is generally the victim of this bad position of the head. If it is not always entirely deprived of life, there is little room for hope, when the midwife or accoucheur confess their inability, and call in a second.

913. To change the position of the head thus retained at the entrance of the *pelvis*, we must act immediately upon it, in order to avoid the rock on which the mobility of the *trunk*, in these circumstances, has precipitated many an accoucheur, who imagined they had turned the child's face to one side, or underneath, because they had easily turned the breast so.* It must be remembered, that this rotatory motion of the *trunk* is always more free and easy, as the child's neck has been more stretched; and that we only twist it, and facilitate the separation of the *trunk* from the head, when we exceed its proper limits.

914. After having brought down the child's arms cautiously, especially if it be still living, we must support the *trunk* with the left hand, and slide the right, except the thumb, along the back of the neck, to push up the *occiput* above the *sacro-vertebral* angle, and turn it towards one of the *sacro-iliac symphyses*, or even to one of the *acetabula* if we can. While we turn away the *occiput* thus from the projection of the *sacrum*, we must take care to turn the *trunk*, which is without, in the same direction. When the head is completely in the cavity of the *pelvis*, we may place the face underneath, in order to extract it conveniently.

* See de la Mothe, among others, Observ. 275, nouv. edit.

Labours in which the Child presents the Knees.

915. The union of all the circumstances, without which delivery cannot be performed naturally, that is, without assistance, is so rarely met with in a woman whose child presents the knees, that we may be allowed to class this species of labour among the preternatural, independently of those circumstances which may render it so when it begins with the most favourable appearances.

Of the Causes which render a Labour, in which the Child presents the Knees, difficult, or preternatural.

916. The obstacles which most frequently oppose the intentions of Nature in this species of labour, arise from the presentation of only one knee at the orifice of the *uterus*, while the other extremity, folded up, is retained above the margin of the *pelvis*, so that the child cannot descend, notwithstanding the violence of the efforts which tend to expel it.

917. Neither can the delivery be easily performed without assistance, when the two knees present together; because those parts, as they come down, may but against the curve of the *sacrum*, and stop there, while the feet, pushed down by the breech, which is then forced to engage, tend to come out first; which cannot take place unless the *pelvis* be very large. When it is narrow, delivery becomes impossible without help.

918. To these causes, which frequently make it necessary to have recourse to art, in labours where the child presents the knees, we may add all those which I have mentioned before, such as convulsions, flooding, &c.—See par. 785, and following.

Of the Characteristic Signs of the several Species of Labour in which the Child presents the Knees, and the Indications they present relatively to the Mode of operating.

919. The essential differences of those labours where the child presents the knees, as well as their signs, having been stated in par. 548, and following, it remains now to treat of the indications presented by these labours. Among those indications, some are general, and others particular. The latter are deduced from the situation of the knees, as well with respect to each other, as to the *pelvis* of the mother, and from the accidents which complicate the labour. The general indications are the same as in those labours where the child presents the feet.

920. Some practitioners have thought it right to bring down the feet, whenever the knees present; but far from giving such a precept, I shall lay it down as an invariable rule, never to search for the feet, unless the labour be complicated with some accident, and the knees still at the entrance of the *pelvis*, or capable of being easily pushed back to it: otherwise, we must let them descend, and content ourselves with favouring their progress, by turning them off from those parts of the *pelvis* where they

might be stopped; till we can hook them with the fore finger of each hand, insinuated into the bend of the hams, and so bring them along.

921. These aids, which in common cases are only, as I may say, of a relative utility, become absolutely necessary when the woman is exhausted, or when any alarming accident requires us to deliver immediately. If the knees are still far off at the time when we are obliged to operate, we must push them up above the margin of the *pelvis*, then introduce the hand, and search for the feet. We proceed in the same manner when the knees, pushed down by the efforts of labour, are stopped in the curve of the *sacrum*, and the feet are descended as low on another side, so that the legs lie across the *pelvis:* we then push up the knees, and bring down the feet. But we act differently when the knees are low down, and the feet still high up. We ought, in that case, to endeavour to bring them down, by means of the fingers insinuated into the hams, as directed in the preceding paragraph; if we cannot succeed with the fingers, we may have recourse to a fillet.

922. The best fillet is made of a piece of tape an inch wide, and an ell long. We double it, and adapt the loop to the end of the fore finger, keeping it fixed there, by pulling the two ends with the other hand. We introduce the finger, covered with the fillet, on the outside of the knee; then insinuate it between the leg and thigh, turning it into the bend of the ham, so that its extremity may pass across it, to the inside of the knee: there we must fix it with the end of the thumb while we bring the finger round from the other side; then with the finger and thumb draw down one of the ends. It is never necessary to apply a fillet upon each knee, one being fully sufficient.

923. The fillet being thus fixed on the bend of the ham, we take hold of both ends with one hand, and winding them, if they are long enough, two or three times round the fingers, pull downwards according to the axis of the *pelvis;* while with the fore finger of the other hand a little bent, and applied to the outside of the second knee, we keep it close to the first, that it may be obliged to descend at the same time, and follow the same direction.

924. For want of a fillet we may advantageously, and with much less trouble, use a blunt hook, in the same manner as I have frequently applied that which terminates the handles of *Levret's* forceps to the groin, when the breech has been a long time jambed in the *pelvis*, and could not advance: but for the knee a different hook will be necessary, such as I have recommended in par. 935.

925. Whether we have recourse to fillets or to the blunt hook, whether we propose to push back the knees and bring down the feet, or only direct the former so that they may easily pass through the canal of the *pelvis*, it is of no great importance whether we use the right or left hand. But it is not so when only one knee is advanced, and the second, being retained above the brim, opposes delivery. In that case, in which we must at least search for the foot of the retained extremity, if we cannot bring down both, by first pushing up a little the knee which has descended; the facility of the operation depends on the choice of the hand which we insinuate into the *uterus;* and that choice must be determined by the relative situation of the two inferior extremities of the child, as well as by the particular situation of that which is retained at the brim of the *pelvis;* so that sometimes we must introduce the right hand, and sometimes the left.

Of Labours in which the Child presents the Breech.

926. By recollecting here what I have said in another place concerning the causes which may render a labour preternatural, though it had begun in the most advantageous manner, and the difficulty which most women experience in delivering themselves, without help, of a child presenting the breech, it will be allowed that those labours may justly be classed as such; and that having in another place shown the mechanism by which they are sometimes performed without help, it is proper to state the causes which may render them difficult, and to describe the manner of terminating them in those circumstances.

Of the Causes which may render those Labours where the Child presents the Breech, difficult, or preternatural: the essential Differences of those Labours, and their distinguishing signs.

927. I shall confine myself to the exposition of the causes which may render this species of labour impossible, or at least very difficult and dangerous without assistance. Among those causes, some have been the subject of several preceding sections (see par. 785, and following); others are peculiar to this species of labour, and sometimes depend on the extraordinary size of the child's breech, relatively to the *pelvis* of the mother, and sometimes only on their situation.

928. The essential differences of these labours arise from the manner in which the breech presents with respect to the brim of the *pelvis*.

929. It is not always more easy to discover the position of the breech, than to determine whether that is the part which presents. We often find a great deal of difficulty in it, especially before the membranes are open, and when the breech has been a long time engaged and jambed between the bones of the *pelvis*. In the first case it is, as I may say, not only beyond the reach of the finger, but recedes still farther on the least pressure; the child enjoying a great mobility while surrounded by the *liquor amnii*. In the second case, where the waters are evacuated, the breech is always found considerably tumefied. Some accoucheurs have mistaken it, but chiefly in the latter case, for the child's head, whose teguments they supposed were swelled and puffed up.

Indications in those Labours where the Child presents the Breech.

930. The idea which has been formed of the relation which the dimensions of the child's breech bear to those of the mother's *pelvis*, has given birth to a variety of opinions concerning the mode of operating in these labours. The indications in this species of labour are different, according to the circumstances which complicate it, its advancement, the position of the breech, and its size.

931. When none of those accidents before mentioned exist, if the child's breech be small, or even of a middling size, relatively to the diameters of the *pelvis*, provided also that it be well situated, we ought to leave its expulsion to the efforts of Nature. But if it comes along with difficulty, when it is

arrived at the lower part of the *pelvis*, we may assist it by pulling towards us, during every pain, with the fore finger of each hand, curved like hooks, and insinuated into the groins; or with one finger only, applied preferably to that groin which answers to the *sacrum* of the woman. After thus disengaging the trunk and the feet, we finish the delivery, as if the latter had presented naturally.

932. When the obliquity of the *uterus* is considerable, and when it contains a great deal of water, the child's body may be so inclined, relatively to the axis of the *pelvis*, as to present but one buttock. In that case, delivery can seldom be performed without help, whatever may be the size of the breech; at least, unless the second buttock, which is retained on some part of the margin of the *pelvis*, approach the superior *strait*, so that they may both engage at the same time: or, in other words, the length of the body must become nearly parallel to the axis of the superior *strait*. This change is often procured by making the woman lie on the side opposite to the deviation of the *uterus*, at the beginning of labour, and especially at the time the waters are evacuated. When that precaution is not sufficient, we must introduce the hand to the entrance of the *uterus* to bring the buttock which rests on the edge of the *pelvis* to the superior *strait;* or, which is infinitely better, to bring down the feet.

933. The feet must always be sought for, when the woman is attacked or threatened with any accident, and when the volume of the breech so far surpasses the size of the *pelvis* that it cannot engage in it, or not without a great deal of difficulty; because, in all those cases, it is to be feared that the woman may be exhausted, and sink, before that part be sufficiently advanced, to be hooked, and brought

along with the fingers, in the manner directed in one of the preceding paragraphs. We must not however undertake to bring down the feet, every time that any accident requires us to deliver without delay, when the child presents the breech. This method cannot be safely put in practice, but when the breech is still at the entrance of the *pelvis*, or so little advanced, that it is easy to push it back. When it occupies the bottom of that cavity, or is strongly wedged in it, and especially when it has cleared the orifice of the *uterus*, we ought not to think of bringing down the feet; * because it would expose both mother and child to additional danger.

934. In these latter cases we must endeavour to bring along the breech with the fore finger of each hand, curved like a hook in the bend of the groins. If we do not succeed by that method, recourse must be had to fillets, or blunt hooks. Were we to consider only the materials of these different instruments, and their mode of acting, the fillet would, no doubt, merit the preference: but its application is so difficult, that it is with a sort of repugnance that I reckon it here among the resources of the art.

935. Blunt hooks merit the preference in all these cases: many accoucheurs have proposed them before me. These hooks should be about an inch and a quarter long, rather round than flat, and terminated nearly in the figure of an olive: their stems must be about a foot long, and a little curved, that they may accommodate themselves to the convexity of the child's hips; and, besides, must be so formed, that one may easily be united to the other, and form

* The student's attention is requested to these important distinctions. W. P. D.

if needful, a kind of forceps. For want of these hooks, I have often successfully used those which terminate the handles of the forceps.

936. One hook may suffice to extract the child's breech when it is engaged diagonally, provided we place it on that groin which is next the *sacrum* of the mother; but when it presents in the third or fourth position, and is strongly wedged in the *pelvis*, as the obstacles to its exit are much greater, it may perhaps be necessary to apply two crotchets, in order to use them like a pair of forceps.

Of the Signs which characterize the different Species of Labour, in which the Child presents the Breech, and the method of bringing down the Feet in those Cases.

937. In the first of these species of labour, the breech presents diagonally at the entrance of the *pelvis;* so that the child's left hip answers to the right *acetabulum* of the mother, and the right hip to the left *sacro-iliac symphysis;* the back being placed under the anterior and left lateral part of the *uterus*, and the breast turned towards the posterior and right lateral part of it. Of all the positions of the breech, this is the most favourable for its exit, whether it be performed without help or not.

938. When the circumstances which complicate the labour require us to bring down the feet, the accoucheur must search for them with the left hand, which he will introduce by sliding it up before the right *sacro-iliac symphysis*. He must first raise up the breech, if it has begun to engage, and direct it over the fore part of the left *iliac fossa*. Then insi-

nuating the hand along the posterior part of the child's thighs and legs, if they should be extended towards the breast, he will find the feet, which he may hook with the ends of the fingers, a little bent, and bring them to the entrance of the *vagina*. He must then take hold of them differently, to bring them entirely down, and finish the delivery as if the feet had presented naturally in the first position. —See par. 829, and following.

939. In this case, as in many others, but particularly, when the breech presents, provided the child be not very large relatively to the capacity of the mother's *pelvis*, we may content ourselves with bringing down one foot, if we find any difficulty in bringing down both. We need not fear that the other inferior extremity, if we bring down but one, should be stopped at the edge of the *strait*, so as to hinder the descent of the breech: but we must be careful to observe the precautions given in par. 863, till it is without.

940. In the second position of the breech, as in the first, it presents its greatest breadth diagonally at the entrance of the *pelvis;* but so that the child's right hip answers to the left *acetabulum*, and the left hip to the right *sacro-iliac symphysis;* the back being then under the anterior and right lateral part of the *uterus*, and the breast towards the posterior and lateral part of it. When bringing down the feet is judged necessary we are to employ the right hand in searching for them, and then proceed as in a second presentation of the feet.—See par. 889.

941. The position of the breech which constitutes the third species, is such that the child's back answers to the anterior part of the *uterus* and the *pubes* of the mother; the face and breast being towards the posterior part, and consequently underneath.

942. When it is necessary to search for the feet, we must introduce the hand towards the posterior part of the *uterus*, along the hind part of the child's thighs and legs. We first remove the breech from the superior *strait*, carrying it forward and over the *pubes*, and then take hold of the extremities. We might immediately make the breech describe the *demi-tour* mentioned in the preceding paragraph, if it did not appear better to wait for that till the feet are entirely disengaged.

943. In the fourth position of the breech it is so placed, that the child's back is towards the lumbar column of the mother, while the face and breast are under the anterior part of the *uterus*. It is the least frequent and least favourable of all the four positions.

944. In this case, Nature generally finds so many obstacles to delivering herself without help, that it is always better to remove the breech, and bring down the feet, when we arrive in time, than to abandon the woman to efforts, which might be useless, and besides augment the difficulties inseparable from this species of labour. We ought never to neglect this rule but when we are called too late to follow it. In that case, when the breech is, as it were, wedged at the bottom of the *pelvis*, we must endeavour to draw it down with the fingers applied to the groins, or with blunt hooks if circumstances require it: but in disengaging it then, we must observe to make it describe the *demi-tour* mentioned above, in order to begin to turn the face from over the *pubes*.

945. In this species of labour it is very indifferent whether we introduce the right hand or the left into the *uterus*, to search for the child's feet. Either one or the other should be introduced in a

state of supination, when the breech is engaged in the superior *strait*, in order to push it up more easily: we then direct the fingers united on one of the child's hips, and the thumb on the other, so as to enable us to grasp the lower part of the *trunk* firmly, and make it describe a quarter turn, or more if we can, to bring the back towards one of the *iliac fossæ* of the mother; that is to say, towards the right when we use the right hand, and *vice versa*. After that, we search for the child's feet by advancing the hand along the posterior part of the thighs, and bring them down, as in all the preceding positions.

Labours in which the Child presents the Crown of the Head at the Orifice of the Uterus.

946. Those labours, in which the child presents the crown of the head at the orifice of the *uterus*, would always be the most advantageous, if the laws of Nature in this function were immutable, if women were exempt from every species of accident, and if the proportion usually found between the diameters of the head and those of the *pelvis* were constantly the same: for the obstacles which obstruct these labours, or render them difficult and dangerous, proceed only from these three sources, united or separate.

Of the Causes which may render those Labours in which the Child presents the Crown of the Head difficult or preternatural, and the indications they prescribe.

947. These causes, the greater part of which have been already explained, in as many particular sections, are very numerous. Those which proceed from the mother, depend on the defects of the *pelvis*, on the want of sufficient strength to expel the child, and on accidents which supervene before, or during the course of labour. Those which depend on the child arise from the extraordinary size of the head, relatively to the *pelvis* of the mother; from the manner in which it presents at the entrance of that cavity; from the presence of a hand, or a foot, which hinders it from engaging in it; from the direction which the expulsive forces of the *uterus* impress on it; from the descent of the umbilical cord, &c.* In order to determine more clearly what I mean by bad positions of the head, and demonstrate the mechanism by which several of those positions may take place in the course of labour, I shall make them the subject of a particular section.

* I do not speak here of those causes which absolutely require the help of instruments; I shall speak of them in the fourth part of the work.

Of bad Situations of the Child's Head in general, and particularly of that which it is sometimes forced to take as it advances in the Pelvis.

948. The position of the head is disadvantageous, though it presents the *vertex*, whenever its greatest diameter is not placed parallel to the greater diameter of the *strait* which it must pass: it will therefore be so when the *occiput* or the forehead shall be turned towards the *pubes* at the beginning of labour, or remain towards one of the *ischia* at the latter end. In all these cases, the position of the head will be so much more disadvantageous, as the woman's *pelvis* shall depart farther from a good conformation; and much more still, as the face shall have more propensity to turn towards the *pubes* in the last period of labour.—See par. 479, and following.

949. Although the child's head present favourably at the entrance of the *pelvis*, the labour cannot be easy, unless in its descent it take the course which I have described in treating of the mechanism of the different species of natural labour. When it engages otherwise, its greatest diameters advance foremost, and present themselves in all their length to those of the inferior *strait;* sometimes in one direction, and sometimes in another: which generally renders its delivery very difficult, and sometimes impossible without help.

950. When the head takes its natural course, it preserves its anterior flexion, and the chin remains against the upper part of the breast, till the base of the *occiput* come against the centre of the arch of the *pubes*, or on the anterior edge of the perinæum, if the face come upward. But we observe the con-

trary in the case in question; the chin quits the breast, and the head turns backward as soon as it begins to engage; so that it is the anterior *fontanelle*, or the upper part of the forehead, which at last places itself in the centre of the inferior *strait.*

951. This position is the effect of the direction of the expulsive forces of the *uterus*, and of the manner in which they act on the head. We hardly ever observe the obliquity of the *uterus*, which is the determining cause of it, not to be on the same side to which the *occiput* answers. The direction of the expulsive forces in other cases is constantly such that they act on the head so as to make the occipital extremity descend; but in this, the direction of those same forces traverses the head obliquely from the base to the *vertex*, and from the *occiput* to the forehead, a little before the centre of motion, and obliges it to turn backward in proportion as it advances.

952. It is always pretty easy to prevent the head from taking this bad position as it engages in the *pelvis*, and make it follow its usual course: we need only change the direction of the uterine forces in proper time, and support the anterior part of the head a little while, to make the occipital extremity descend. We must then, in great obliquities of the *uterus*, begin by rectifying that *viscus*, and bringing its axis nearly parallel to that of the *pelvis;* either by causing the woman to lie on the side opposite to the deviation, or by making a convenient pressure on the belly. Then, by means of several fingers introduced into the *vagina*, we must support the child's forehead, during each pain, in order that the natural efforts, whose direction is no longer the same, may act on the *occiput*, and force it down. But in doing this, we ought carefully to avoid pressing on the

anterior *fontanelle*, or its environs, where the bones are very supple, lest the child be destroyed by their depression, and the consequent injury to the brain, which however cannot be very great if we act methodically.

953. We must act in the same manner to rectify the position of the child's head, and reduce it to its natural course, when we have not been able to prevent the bad situation in question. The woman being laid on the side opposite to the deviation of the *fundus*, we must push up the forehead as much as possible during the pain,* and with the precautions already recommended. If we should not succeed completely in this manner, we must introduce the fore and middle fingers of the other hand above the protuberance of the *occiput*, to assist its descent, by pulling downwards, as if we were making use of a crotchet.

954. It is so rare that we cannot by this double action bring about the necessary change, or convert the bad position of the head into a better, that it might seem useless to prescribe any other methods: but however, as the head may be so wedged between the bones of the *pelvis*, that the fingers may not be able to penetrate above the *occiput*, I shall mention this case again in the sequel, when I treat

* I would recommend pushing up the forehead during the pain, and not during the calm which follows it; because the efforts of Nature, whose direction we have changed, by changing the position of the *uterus*, act on the *occiput*, and force it down as they do in a natural labour, which we greatly assist by pushing up the forehead at the same time.†

† I am sorry to differ with our author in this advice, my experience being much in favour of acting on the forehead in the absence of pain; and maintaining the forehead with my fingers until the contractions of the *uterus* force down the *vertex*. W. P. D.

of those labours, in which the lever, commonly called *Roonhuisen's*, may be of some use.

955. The head almost always passes the *pelvis*, and the labour terminates with the first pains which come on after we have corrected the position, at least if no other causes obstruct it. But if circumstances require it, we may use the forceps, or act differently according to the nature of the case.

Of the Indications in those Labours in which the Child presents the Crown of the Head, when complicated with Circumstances that render them difficult.

956. The greater part of the causes stated in par. 947, present different indications in some respects, not only according to their species, and their violence, but also according as they manifest themselves sooner or later in the course of labour.

957. When the head presents its greatest length to the small diameter of a *pelvis* rather narrow from the *pubes* to *sacrum*, we have no other indication to fulfil, than to remove it, and place it in a better position, as directed in par. 612, and following. When this faulty position only takes place at the inferior *strait*, we proceed in the same manner, with this difference, that we direct the length of the head according to the diameter which goes from the *pubes* to the *sacrum*. If the presence of a hand, or a foot, opposes the descent of the head, we must push them up above it, and return them into the *uterus*, unless some other circumstances require us to act differ-

ently.* Lastly, we must correct the defective course of the head, when it deviates from that which I have traced, in treating of each species of natural labour.

958. Whenever a violent flooding, or any other serious accident, happens in the course of labour, we ought to deliver immediately; but in different ways, according as the labour shall be more or less advanced at the instant when the operation becomes indispensable. If the child still preserves all its mobility above the entrance of the *pelvis*, or if it be but just beginning to engage in that *strait*, and the waters have not been long discharged, we ought to turn and extract it by the feet. But if the head has descended half its length, especially if the waters have been some time evacuated, it is better to use the forceps. That instrument merits the preference much more still, when the head occupies the lower part of the *pelvis*, and must be employed exclusively, whenever it has cleared the neck of the *uterus*, and is entirely in the *vagina;* for then no other method can save the child.

959. The forceps merit exclusively the preference when the head entirely occupies the cavity of the *pelvis*, and nothing but not having them at hand when the necessity is urgent, can justify turning; this is indeed only admissible, first, where the head has passed the superior *strait* easily, and secondly, when it has carried before it the circle which constitutes the neck of the womb. Some may condemn this last precept, by urging the danger it offers to mother and child; but experience enables me to declare, that the child's head may be pushed back with little inconvenience if it were even yet lower, provided it be not enveloped in the neck of the *uterus*.

* See par. 1077, and following.

960. I have before remarked, in par. 455, that the head might occupy the lower part of the *pelvis*, without having cleared the orifice of the *uterus*, and that it was important to distinguish this case accurately from that in which it is entirely in the *vagina*. Though in the former case there is no more inconvenience in pushing up the head above the superior *strait*, and in turning the child, than in that where it is but little advanced, every thing with respect to the conformation of the *pelvis*, the contraction of the *uterus*, &c. being the same, there would be a great deal when it has cleared the neck of that *viscus*, and is entirely in the *vagina*. By pushing it up then above the brim, we should run the greatest risk of tearing the *vagina* from its connexion with the *uterus*, &c. The forceps are exclusively indicated in this circumstance, as I have already said, unless the certainty of the child's death permit us to use crotchets: and I should prefer them in the other, because their application is simple, and their effects quicker and more certain, than those of turning the child.

961. The accidents stated in par. 1079, such as flooding, convulsions, frequent *syncopes*, an exhaustment of the woman, and the exit of the umbilical cord, &c. are not the only causes which reduce us to the necessity of turning a child who presents the crown of the head: a deformity of the *pelvis* sometimes prescribes the same indications. Almost all those who have advised and practised it on account of this last circumstance, have done it without any regard to the extent of the disproportion between the dimensions of the child's head and those of the *pelvis;* so that for one child they have saved by this method, a great number have been victims to it. This method cannot be proper but in those cases

where the disproportion which obstructs delivery is very small: when it is more considerable, it requires the forceps, crotchets, the cæsarian operation, &c. according to the state of the child, as we shall see in the sequel.

General Rules for turning the Child to bring it by the Feet, when it presents the crown of the Head.

962. When we are obliged to turn a child who presents the crown of the head to the orifice of the *uterus*, the membranes are entire, or not, and the waters recently discharged, or a long time ago. In the former case, the child is in some measure free in the midst of the *uterus:* and in the latter, it is so closely embraced by it, that the hand cannot penetrate it without difficulty, even when well directed. It is in the latter state I shall suppose it to be, because it requires more sagacity on the part of the accoucheur than the other case, and because he cannot then neglect the following rules, without exposing both mother and child to great inconveniences.

963. The woman being placed conveniently, we must introduce the right or left hand into the *uterus*, according to the position of the head. We must then disengage it from the superior *strait*, if it be engaged in it, by pushing it upward and forward, to make it follow the direction of the *strait*. We then apply the hand to the forehead, and carry the head towards one of the *iliac fossæ*, where it must be retained during the operation, by means of the wrist and fore-arm, to hinder it from being forced downward again by the pains, while we search for the feet.

964. In order to find the feet, and bring them down more easily, having removed the head sufficiently from the superior *strait*, we must insinuate the hand along that side of the *trunk* which is nearest the posterior part of the *uterus*. We first pass the fingers close together over the ear, from thence over the side of the neck, but a little backward, in order to avoid the projection of the shoulder; we then conduct them gently along the side and hip, from whence we pass along the thigh and leg to the feet. We hook the feet with the ends of the fingers a little bent, and bring them to the entrance of the *vagina*, making them pass over the breast and face of the child. When we can take hold of but one foot at once, we must take that which belongs to the side that the hand has passed over; unless it be engaged in the bend of the ham of the other leg, as we sometimes meet with it; for then we must begin by bringing down the foot of that leg first. As soon as we have brought one foot out of the *uterus*, we must introduce the hand again to search for the other, either by tracing the same course as before, or along the back of the extremity already brought down, according to the difficulty or facility we meet with: which will be more precisely determined by laying down the rules which relate to each particular case.

965. By strictly observing the route which I have just laid down, we shall avoid taking the child's shoulder for the hip, the elbow for the knee, and the hand for the foot; which it is not always very easy to distinguish, when the hand that operates is strongly pressed in the *uterus:* for all these extremities will present themselves successively to the fingers, and not *pell mell*, as we generally meet with them, when, according to the advice of most accou-

cheurs, we pass the hand along the child's breast. Besides, by following that course, the feet are almost always found against the back of the hand, and we can neither distinguish them, nor take hold of them; so that sometimes we search for them far off, when they are very near: add to that, that we remove the child's arms from the axis of the *trunk*, and render turning more difficult. By the first method, on the contrary, we bring all those parts to a common centre, we roll the child up, as I may say, like a ball, and turn it with greater facility.—See the paragraphs 853 and 856.

966. Some practitioners, in whom strength seems to supply the place of knowledge, most frequently content themselves with bringing down one foot, whether the child present the crown of the head, or any other part. But though they sometimes perform the delivery by pulling only at one extremity, sometimes also, after having luxated, fractured, and even torn it off, they are reduced to the shameful necessity of searching for the other. At most, it is only when the waters are but just drained off, and the *pelvis* is of the natural size, that we may dispense searching for the second foot, and undertake to deliver by one: but that is precisely the case in which there is the least trouble in bringing down both at once.

967. When we find much difficulty in bringing down the feet, if we can bring one out, or only to the *vulva*, we must fix a fillet on it, to keep it down while we search for the other.

968. When we have brought both feet to the orifice of the *uterus*, it is not always without a great deal of trouble that we are able to bring them down; either because it is difficult to grasp them both with one hand, or because the head is still retained in

the neighbourhood of the superior *strait*, and cannot of itself recede sufficiently to allow the breech to engage in it. Though it is necessary in that case, in order to obtain the proposed end, to remove the head, yet we are not always able to do it conveniently with the same hand which holds the feet; because we are sometimes obliged to pull them down, at the same time that we push the head back: which happens more particularly when the waters have been long evacuated, and much more still in some other presentations. But as it is impossible at once to pull down the feet, and push back the head with the same hand, and not less so to introduce both hands together into the *vagina*, in order to apply one to the head and the other to the feet, we place a fillet on one of the latter, to bring it down by pulling at a distance, while with the other hand, introduced at the entrance of the *uterus*, we remove the child's head from the superior *strait*. By acting thus, a moderate force will suffice to overcome an obstacle, which that of several persons united, applied to the feet only, would often scarcely be able to surmount.

969. It is never necessary to apply a fillet on each foot, nor to inclose both feet in one fillet: it is sufficient to apply it to one, and we generally place it on that which is next the *pubes*.*

970. To apply the fillet, we double it in the middle, and pass the two ends through the loop, so as to form a kind of slip knot. It is easy to pass it over the foot as far as the ankle, when it appears at the *vulva;* but very difficult, when it is still high up

* This must depend on which foot is brought down; we cannot apply a fillet on the foot next the *pubes* when it is the one next the *sacrum* which is down, and when both are down the fillet is certainly unnecessary. W. P. D.

in the *pelvis*. In that case, some practitioners slide the loop of the fillet over the hand, on the wrist, and introducing the same hand into the *vagina*, take hold of the foot, and slip the loop over it, by pushing it forward with the fingers of the other hand, tightening it more or less by pulling the two ends which hang without.

Of the distinguishing Signs of the first, second, and third Species of preternatural Labour, in which the Child presents the Crown of the Head, and the Manner of turning the Child in those Cases.

971. I SHALL here only just repeat the characteristics of that position of the head which constitutes the first species of labour, having already treated of them sufficiently at large in another place. That position is such, that the *sagittal suture* crosses the *pelvis* obliquely, from the left *acetabulum* to the right *sacro-iliac junction;* the forehead being before the latter, and the *occiput* behind the former.

972. Though it may seem indifferent to some, whether they introduce the right or left hand into the *uterus*, to turn the child, immediately after opening the membranes, when the head presents in this position, yet, when the waters have been long evacuated, it is so important to use the left, that to the want of attention to this circumstance we may attribute all the difficulty in getting hold of the feet, as well as that apparent impossibility of doing it, which has often obliged the operator to withdraw his hand twenty times before he could accomplish it. If the left hand is so necessary in the latter case, it cannot be denied that it is preferable to the right

in the former; for in both, the left hand has much less ground to go over than the right, to arrive at the feet, and with that we may bring them down in the most natural direction, and turn the child in the most favourable manner: which it is almost impossible to execute with the right hand, especially when the waters have been long evacuated, as may be clearly demonstrated on the machine.

973. The left hand is always to be used in this species of labour, it must be introduced in such a manner as the palm of the hand will apply to the forehead of the child; the head is to be removed to the left *iliac fossæ* where it must be retained by the wrist and fore arm, while we search for the feet, and bring them down as already directed.

974. After the feet are brought to the middle of the *vagina*, the head must again be removed from the superior *strait*, that the body may fold more easily. If we cannot bring both feet beyond the middle of the *vagina*, we must let go one, and search for it again when the other is disengaged.

975. As soon as the feet appear without, we must pull almost entirely, but for an instant only, on that which is under the *pubes*. By that means we favour the descent of the breech, we often avoid some difficulties, and constantly turn the child's breast towards the left *sacro-iliac junction;* so that the *trunk*, as it descends places itself in the same manner as in the second species of the presentation of the feet. The rest of the operation must be conducted as in that species.—See par. 893, and following.

976. The position of the head, which constitutes the second species, will appear the same as the preceding, if we only consider the proportion between the dimensions of the head and those of the entrance

of the *pelvis;* since in both the *sagittal suture* crosses that *strait* obliquely. The difference between them is, that in this second position the *occiput* answers to the right *acetabulum*, and the forehead to the left *sacro-iliac junction.*

977. We employ the right hand in this position and proceed as directed in par. 964, and following; when the feet are without we observe the rule stated in par. 1205.

978. In the third species of labour, in which the child presents the crown of the head, the *sagittal suture* crosses the entrance of the *pelvis* directly from before backwards, so that the *occiput* answers to the *pubes*, and the face to the *sacrum.*

979. This position, of itself, may render labour difficult or preternatural, independently of any other cause, when the woman's *pelvis* is not perfectly of the natural size; because the largest diameter of the head presents parallel to the smallest diameter of the superior *strait*, and in the direction in which that *strait* is the oftenest contracted: but when the *pelvis* is well formed, this position may be as favourable for delivery as the preceding ones. The indication which it presents in the former case, is easily deduced from what has been said of the relative dimensions of the head to those of the *strait.* We must remove the *occiput* from over the *pubes*, and direct it towards one of the *acetabula:* the fingers introduced into the *vagina* are commonly sufficient to procure this change, provided we attempt it early.

980. When any of those circumstances occur, which require us to turn the child and bring it by the feet, either hand may be introduced into the *uterus*, with equal advantage, provided the accoucheur be accustomed to use them equally. We

must slide it up, along the *sacrum*, till we can grasp the forehead, and a part of the rest of the face. We then give the head a quarter turn, so as to place the face on one side; and we must remember afterwards to do the same by the *trunk;* because the first movement is confined to the head, and is effected only by a twist of the neck. When we use the right hand, we turn the face towards the woman's left side, carrying the head towards the right *iliac fossæ*, and *vice versa:* and then finish the delivery, as in the first and second species, according to the hand we have made choice of.

Of the Signs of the fourth, fifth, and sixth Species of Labour, where the Child presents the Crown of the Head, and the Method of operating in all those Cases.

981. In the fourth and fifth of these species of labour, the child's head presents diagonally at the entrance of the *pelvis;* but so that in the fourth the *occiput* answers to the right *sacro-iliac symphysis*, and the forehead to the left *acetabulum;* whereas in the fifth the forehead is situated behind the right *acetabulum*, and the *occiput* opposite to the left *sacro-iliac symphysis.*

982. I have observed in paragraphs 479, 501, and following, that labour is, in general, more difficult when the child's head presents in either of these positions, than in the former: because in these the face almost always turns under the *pubes.* But it is very rare, when the *pelvis* is well formed, that this circumstance alone obliges us to turn the child; either because the head can pass it, though

with a little more difficulty, or because the obstacles, which result from these positions, do not manifest themselves till the head is low in the *pelvis*, and when it is too late to push it back and search for the feet, the forceps being then much more eligible.

983. If the head cannot disengage in this position, in which the forehead answers to the arch of the *pubes*, we must make use of the forceps: but if other circumstances, independent of this position, invite us to deliver sooner; especially if they manifest themselves while the head is free above the *pelvis*, we ought to deliver by the feet. The method of turning the child, when the crown of the head presents in the fourth position, is exactly the same as for the second; and in the fifth position we proceed as in the first. See the paragraphs 973 and 977, where I treat of those two species of labour.—I shall only observe here, that in these two species of labour especially, the accoucheur must pull almost entirely at the foot which is under the *pubes*, from the time they both appear without; that is to say, at the left foot in the fourth species, and at the right in the fifth; in order to bring down the breech more easily, and at the same time to turn the breast towards one of the *sacro-iliac symphyses*.

984. In the sixth species of the presentation of the crown of the head, the forehead answers to the *pubes* in every period of the labour, and the *occiput* to the *sacrum*.

985. This species of labour, considered as a natural one, unites all the difficulties essential to the third, fourth, and fifth species; for the head presents its largest diameter to the smallest one of the brim, and the face constantly places itself under the *pubes*.

986. In order to shorten the labour, which in this

case is always very tedious, even when the *pelvis* is of the natural size, we ought to turn away the *occiput* from over the projection of the *sacrum*, as soon as the membranes open, if we are called in time, and bring it insensibly towards the arch of the *pubes*, in proportion as the head advances in the *pelvis:* but we must never attempt this change of position when the head is entirely in that cavity; for it would not then be without very great force, that the face could be conducted from under the *pubes* to the *sacrum;* and as that *deplacement* could not be executed without an extraordinary twist to the neck, it would be very dangerous to the child, if it did not kill it instantly.

987. When the *pelvis* is a little narrow, especially if any accidents occur, if the head can still be easily pushed back, we may turn the child, and bring it by the feet: otherwise we must use the forceps.* In the former case, we may introduce either hand into the *uterus;* we first apply the fingers to one of the sides of the head, and the thumb to the other, in order to grasp it with sufficient strength to turn the face on one side; that is to say, towards the left side, if we use the right hand, and *vice versa.* After having removed the head in this manner, and reduced it to one of the two first positions, we con-

* I believe it would be sound practice in this position to turn immediately if called in proper time; and if the labour be advanced to use the forceps. By this means we should save the woman a great deal of unprofitable pain, as the chances are more than even we should be obliged to have recourse to them at last. It is to be remembered we except where there is a great disparity between the size of the head and *pelvis*, and where of course the child advances easily. I have seen two instances of this presentation, where this obtained, and where the labour was rapidly finished. These were two twin cases it may be proper to remark. W. P. D.

tinue to advance the hand in order to take hold of the feet, in the manner prescribed in those positions. Only we must observe, as we proceed, to turn the child's breast the same way as the face, and make the *trunk* perform the same movement, as was given to the head at first. Then finish the delivery as in the preceding species.

Labours in which the Child presents the Face.

988. Authors furnish us with a great many examples of labours in which the child presented the face to the orifice of the *uterus*, and I could have added a pretty large number to them; because those labours are not extremely rare. Of women, whose children present thus, some have been delivered without help, and the labours of others have been extremely laborious.

Of the Causes, Signs, and Differences of Labours in which the Child presents the Face, and the Indications they prescribe.

989. Almost all those who have mentioned this bad position of the child, have attributed it to an obliquity of the *uterus;* and we cannot deny that that obliquity may be, at least, a remote, or predisposing cause of it. But whatever may be the kind or degree of that deviation, the face hardly ever presents at the beginning of labour: at first, the top of the forehead presents, and the face only advances as the contractions of the *uterus* are repeated.

990. Those who have perfectly comprehended what I have said in par. 950, and following, concerning the mechanism of the bad situation the head sometimes takes as it advances in the *pelvis*, when it presents the *vertex*, will not be at a loss to explain why the face may present; and they will also clearly conceive whence the difficulties arise which then obstruct delivery, or, at least, always render it extremely long and laborious.

991. We easily discover the face, by touching the woman immediately after the opening of the membranes; because the signs which distinguish it are not then obscured by the tumefaction which arises soon afterwards: those distinguishing signs are, the nose, the mouth, the chin, the edges of the orbits, and the *suture* which runs along the forehead.

992. I shall distinguish four species of labour, in which the child presents the face, relatively to four principal positions which that region may take with respect to the *pelvis*.

993. In the first, the length of the face presents along the smallest diameter of the superior *strait*, the forehead is situated over the *pubes*, and the chin answers to the *sacro-vertebral* angle.

994. In the second position, the length of the face presents also parallel to the smallest diameter of the entrance of the *pelvis:* but the chin is behind the *pubes*, and the forehead before the *sacrum*.

995. In the third, the face is situated transversely with respect to the *pelvis*, so that the forehead answers to the left side of it, and the chin to the right.

996. In the fourth species, the situation is exactly contrary, the forehead being placed towards the right side, and the chin to the left.

997. These four positions are not equally fre-

quent; the two latter are the most common, though even they are very rare, if we consider them relatively to some of the other positions which have been already described. These labours ought to be accounted preternatural, independently of the accidents which may render those so in which the child presents in the most advantageous manner. For them to be terminated without help, it is requisite that the head should be very small, and the mother's *pelvis* at the same time very large; otherwise they become very long and difficult; the children are born with the face tumefied and livid, and almost always deprived of life, or ready to lose it, on account of the *engorgement* of the brain.

998. The most general indication in these labours, is, to rectify the child's head; that is to say, to make the face ascend, and bring down the *occiput*, so as to reduce the *vertex* to its usual situation. When we cannot so happily second the efforts of nature, either because we are called too late, or because accidental circumstances require instant delivery, we are obliged to turn the child, and bring it by the feet, or extract the head with instruments, if it be far advanced, and wedged in the *pelvis*.

999. According to some, it is losing precious time to endeavour to change this bad position of the head to a better, because, say they, we so rarely succeed in it: but if we succeeded still more rarely, we ought never to neglect the attempt, because of the advantages the child may reap from it, if we accomplish it, and the danger which often accompanies the other methods of delivering.

1000. When we propose to reduce the head to its natural position, it is not so much on the face that we ought to act, by pushing it up, as most accoucheurs have advised, as on the *occiput*, which

we ought to endeavour to hook with the fingers, to bring it downwards. Experience authorizes me to say that that may be executed without much trouble, when the head is moveable at the entrance of the *pelvis*, or capable of being easily pushed back to it: but it is always difficult, and often impracticable, when it is low down, and wedged tight; because the fingers can no longer penetrate far enough to grasp the *occiput* properly.

1001. If then we find nature strong enough to perform the delivery, we ought to endeavour to reduce the head to a good position: but in the contrary state, we must turn, and deliver by the feet, unless other circumstances forbid it, and require the use of the lever, or forceps, as will be more particularly stated in the sequel of this work.

Methods of operating in the different Species of Labour in which the Child presents the Face, when it can be done with the Hand alone.

1002. The first of these species of labour is one of the most seldom met with, and the position which constitutes it is very far from being one of the best. That position is such, that it can seldom be reduced to one of those which would favour the exit of the head; because the hand cannot be conducted directly on the *occiput* to bring it down, as in the following positions. In order to reduce the head to its natural situation in the present case, we must push up the face by means of the fingers placed on each side of the nose, which, however, is not without inconvenience to the child, even supposing little force to be necessary; or else we must begin by

changing the position of the face, and directing it transversely with respect to the *pelvis*, that we may afterwards apply the hand to the occipital region, as prescribed for the third and fourth positions. These manœuvres not being easy to execute, even at the instant the membranes open, with much more reason ought we to have little confidence in them, when the head has already cleared the superior *strait*, and occupies the cavity of the *pelvis*. It is almost always indispensable in the first position of the face, to turn the child and bring it by the feet.*

1003. To do this we proceed as directed for the third presentation of the head in par. 980, and at the same time, remembering to observe the same caution recommended, of turning the face next the hand that operates.—See par. 987.

1004. We cannot expect to reduce the head to a natural position, in the second presentation; it would be wrong and dangerous to attempt it, but when the membranes have just opened. If we determine on it then, the hand must be advanced along the *sacrum*, until the fingers can sufficiently grasp the *occiput* to bring it down; it should be directed towards one of the *acetabula*, that it may insensibly be brought under the arch of the *pubes*.

1005. When circumstances require the child to be turned, either hand may be used. We proceed as directed in par. 987.

1006. When we have no other indications to fulfil in the third species of the face presentations, than that of reducing the head to its natural situation, we must introduce the right hand towards the left side of the *pelvis*, till we can bend the fingers

* I believe it always best both in the first and second positions of the face. W. P. D.

over the *occiput*, to bring it down by pulling it towards us. If the head is low down in the *pelvis*, without however being wedged tight in it, so that we cannot advance the fingers far enough on the *occiput*, we must push up the head, or else endeavour very carefully to raise up the face, by means of the fingers of the left hand applied to the upper jaw, and at the sides of the nose. If we can thus push up the lower part of the face, we give the other hand more liberty to act on the *occiput;* but as we cannot act too cautiously on the face, lest we bruise and hurt it, if we find any difficulty in it, it is better to push up the whole head, and then endeavour to bring down the *occiput.*

1007. When we are obliged to turn the child, whether we have reduced the head to its natural position or not, we must proceed as in the first species where the crown of the head presents. We introduce the left hand into the *uterus*, directing it along the child's left side, till we can take hold of the feet.—See par. 973.

1008. The fourth species of labour in which the face presents, differs little from the preceding with respect to the mode of operating; except that we must execute with the left hand all that is there prescribed for the right, and *vice versa.*

Labours in which the Child presents the fore part of the Neck, commonly called the Throat.

1009. From the silence which most authors have observed concerning those labours in which the child presents the anterior part of the neck, we may infer that they are extremely rare: *De la Motte*

is almost the only one who has mentioned them, and he has cited but two cases.*

1010. *Cause.* Obliquity of the *uterus*, or the great quantity of water it may contain.

Marks. The chin, the top of the breast, top of the *sternum* and *clavicles*.

Indication. Search for the feet.

Varieties. 1. Where the length of the neck is from *pubes* to the *sacrum*, face to the *pubes*, and breast to the *sacrum*.

Mode of Operating. Either hand; when we seize the feet, proceed as directed for turning in third species of head.

2. Face to the *sacrum*, and breast to *pubes*.

Right or left hand as the face may be turned from the lumbar column.†

3. Neck placed transversely, so that the face is to the left *iliac fossa*, and the breast to the right.

Left hand invariably, and proceed as directed in first species of head.

4. Breast at the left *iliac fossa* and face to the right.

The right hand, and proceed as directed in second species of head.

* Our author proceeds to enumerate a great variety of presentations of other parts of the body, with the mode of proceeding in each; but as in all there appears to be but one resource, that is turning, I have thought it best, to merely enumerate the different presentations marked by him, and give a succinct analysis of the mode of treatment, rather than confound the student with such multiplied, and, I conceive, rather unnecessary distinctions. W. P. D.

† It is an invariable rule to use that hand whose palm can be applied to the face of the child. W. P. D.

Labours in which the Child presents the Breast.

1011. We shall not be surprised that there are scarcely any examples well defined to be met with in authors, of labours where the child presented the fore part of the breast, if we consider the attitude it must take to place itself in that manner. It may present the back, the loins, the shoulders, the head, the knees, or the feet, with the hands and the cord*, without losing the oval figure in which it is naturally folded in the womb; but the fore part of the breast cannot place itself at the entrance of the *pelvis*, unless the head, at least, be turned on the back. Some practitioners have even represented it so, having also the thighs extended, the legs bent, and the feet placed on the loins.

Of the Causes, Signs, and Differences of Labours in which the Child presents the Breast.

1012. *Cause.* Extraordinary capacity of the *uterus*, relatively to the *fœtus*.

Marks. The ribs, the clavicles, sternum and upper part of the *abdomen*.

Indication. Turning.

* Authors are full of cases in which the child presented the hands, the knees, or the feet, and the cord at the same time, at the orifice of the *uterus*. I shall not, however, treat of those labours as a particular species, because they require no practical rules, but what are applicable to others.

Varieties.	*Mode of Operating.*
1. Fore part of the neck over the *pubes* and belly over the *sacrum.*	As directed for the neck in par. 1010.
2. Belly over the *pubes*, and neck to the base of the *sacrum.*	ditto.
3. Neck and head on left *iliac fossa*, belly on the right.	ditto.
4. Neck and head on right *iliac fossa*, and belly on the left.	ditto.

Labours in which the Child presents the Belly.

1013. Those labours in which the child presents the belly, will not appear less extraordinary than those where it presents the breast, if we form a just idea of the attitude it must then necessarily take in the *uterus;* an attitude which does not seem to be always precisely the same, if practitioners have distinguished it perfectly; for I have found it vary from their descriptions. Though in these cases the child may sometimes have the *trunk* bent backward, the head turned on the back, the thighs extended, and close together, the legs bent, and resting on the loins, as most authors have described it, so as to form a kind of ellipsis, whose greatest diameter extends from the crown of the head to the knees; sometimes also, as I have seen, the inferior extremities are folded in the usual way, the knees being only a little farther asunder, and placed, as it were, at the sides of the belly.

1014. *Cause.* The same as those of neck and breast.

Signs. The soft abdomen, terminated by the heart and *pelvis.*

Indication. Turning.

Varieties.	*Mode of Operating.*
1. Breast over *pubes*, inferior extremities over *sacrum.*	Right or left hand may be used.
2. Breast over *sacrum*, thighs over *pubes.*	ditto.
3. Breast on left *iliac fossa:* thighs and knees on right.	Left hand.
4. Breast on right *iliac fossa*, thighs and knees on left.	Right hand.

N. B. The common rules for turning to be constantly kept in mind.

Contingency. The umbilical cord almost always down.

Labours in which the Child presents the fore part of the Thighs, and of the Pelvis; their Causes, Signs, Differences, and the mode of operating in them.

1015. *Cause.* The same as determines the presentation of the *abdomen* or breast.

Signs. Abdominal Tumor; parts of generation, especially of the male, two parallel columns, formed by the thighs.

Indication. Searching for the feet.

Varieties.	*Mode of Operating.*
1. Knees to the *sacrum*, abdomen over the *pubes*, breast and face, under the anterior part of the *uterus.*	As for belly and breast.

	Mode of Operating.
2. Knees towards the *pubes*, abdomen, &c. to *sacrum*.	As for belly and breast.
3. Child is placed transversely, knees to the right *iliac fossa*, breast and belly over the left.	ditto.
4. Breast and belly to right *iliac fossa*, knees over the left.	ditto. Following the numerical order.

Labours in which the Child presents the different Regions of its posterior Surface to the Orifice of the Uterus.

1016. These labours are met with a little oftener than those in which the child presents one of the regions of its anterior surface. We have already seen what a strange and uneasy attitude it must take, to present the face, the neck, the breast or the belly, to the orifice of the *uterus*, and what must be the concatenation of causes necessary to produce that effect. It is not so in the labours I am now going to treat of; very simple causes, such as an obliquity of the *uterus*, and a greater quantity of water than usual, may occasion them: because the child, without losing that oval form, in which it is naturally folded, may present the occipital region, the hind part of the neck, the back and the loins.

1017. Nor does the same danger attend these two orders of labours. Those which I am now going to treat of are, *cæteris paribus*, less disagreeable both for the mother and child, and present much fewer difficulties than the former.

Labours in which the Child presents the occipital Region at the orifice of the Uterus. Of the Causes and distinguishing Signs of those Labours, and their Indications.

1018. *Cause.* Obliquity of the *uterus*, or great quantity of water.

Signs. A solid tumour, on which may be distinguished the *posterior fontanelle*, and *lambdoidal suture.*

General Indications. To make the woman lie on the side opposite to the deviation of the *uterus*, or on that side on which the crown of the head is placed. If this does not succeed, the hand must be introduced to bring the *vertex* to the centre of the *pelvis.* If complicated with accidents, we must turn and bring by the feet.

Varieties. 1. Crown of the head against the projection of the *sacrum*, and the back of the neck on the edge of the *os pubis;* back to the anterior part of the *uterus.*

Particular Indications and Mode of Operating.

Lay the woman on her back; if this does not succeed, bring the summit of the head down to the entrance of the *pelvis*, by turning it towards one of the *acetabula.* Then leave it to the efforts of Nature. When accidents complicate it, we must turn, in the same way as directed in the third presentation of the *vertex.* See par. 978.

2. Vertex over the *os pubis*, the hind part of the neck on the base of the *sacrum;* back to the posterior part of the *uterus.*

Turn invariably, observing the cautions, &c. for the sixth presentation of the *vertex.* See par. 984, and following.

	Particular Indications and Mode of Operating.
3. Crown of the head to the left *iliac fossa*, hind part of the neck on the inferior edge of the right *iliac fossa;* back to the right lateral part of the *uterus.*	The patient to lie on the left side; if this does not succeed, introduce the hand, and bring the *vertex* to its natural situation. When circumstances require turning, proceed as directed for a second presentation of the *vertex.* See par. 976, and following.
4. Crown of the head to the right side of the *pelvis*, hind part of the neck to the left, back of the child to the left side.	Lay the woman on the right side; if this be not sufficient to enable nature to deliver herself, reduce the *vertex* to its natural situation. If accidents complicate the labour, proceed as in a first presentation of the *vertex.* See 971, and following.

Labours in which the Child presents the Back of the Neck, commonly called the Nape, their Causes, Signs, Differences, and Indications.

1019. *Cause.* Obliquity of the *uterus*, or an over quantity of water, or both.

Signs. The *spiny tubercles* of the *cervical vertebræ;* the angles of the lower jaw, and superior edges of the *scapulæ.*

General Indications. As delivery cannot take place in any of these cases without assistance, we must first endeavour to restore the head to its natural situation, provided the woman is able to go through the labour. But as this indication for the most part is difficult to fulfil, it is better in general, to disregard it, and search for the feet; if accidents complicate the labour we must turn, without attempting other methods.

Varieties.	*Particular Indications and Mode of Operating.*
1. *Occiput* on the edge of the *pubes*, back over the base of the *sacrum*.	Turn invariably as directed for a sixth presentation of the *vertex*. See par. 984, &c.
2. *Occiput* on one side of the projection of the *sacrum*, and the back over the *pubes*.	We may attempt to reduce the head if called immediately after the discharge of the waters; it is in general however, best to search for the feet as in a third presentation of the *vertex*. See par. 978, &c.
3. *Occiput* on the left *iliac fossa*, back over the right.	Try to reduce the head with the right hand; if this does not succeed, turn as in a second presentation of the *vertex*. See par. 976, &c.
4. *Occiput* on the right *iliac fossa*, back over the left.	The same indications as the last; but the left hand must be employed: if we turn we proceed as in a first presentation of the *vertex*. See par. 971, &c.

Labours in which the Child presents the Back. Of their Causes, Signs, Differences, and Indications.

1020. *Cause.* The same as the preceding.

Signs. A large unequal tumour, on which may be distinguished the *spiny tubercles* of the *vertebræ*, the ribs, and inferior edges of the *scapulæ*.

Indications. The same as those labours of par. 1019, that is turn, and bring by the feet.

Varieties.	*Mode of Operating.*
1. Back of the neck, on the edge of the *os pubis*, and the loins over the *sacrum*.	We employ the right hand to turn, and proceed as has been directed.

2. Loins over the *pubes*, nape of the neck over the posterior edge of the *pelvis*.	*Mode of Operating.* Proceed as in second presentation of the nape of the neck. See par. 1019.
3. Head in the left *iliac fossa*, the loins over the right.	We may operate to turn with either hand, but differently. If the left, we insinuate it at the right *iliac fossa*, if the right, we raise the child and carry the back above the *pubes*, and search for the feet, and pull almost entirely at the left.
4. Head in the right *iliac fossa*, the loins in the left.	The same indications as the third, we may operate with either hand according to circumstances.

Labours in which the Child presents the Loins, their Causes, Signs, Differences and Indications.

1021. *Cause.* Obliquity of the *uterus*, or an over portion of water.

Signs. The false ribs on one side, and the posterior angles of the *ossa ilia* on the other.

Indication. Turn and bring by the face.

Varieties. 1. Back over the *pubes*, breech over the *sacrum*.	*Mode of Operating.* The same as in the presentation of the back. See par. 1020.
2. Breech and feet over the *pubes*, and back and head to the posterior part of the *uterus*.	ditto. See par. 1020.
3. Back over left *iliac fossa*, breech and feet over the right.	ditto. See par. 1020.
4. Back and head over the right *iliac fossa*, breech and feet over the left.	ditto. See par. 1020.

Labours in which the Child presents the lateral Regions of its surface.

1022. Every one knows that the surface of the body presents two sides perfectly similar; the right, and the left; and that we may distinguish several regions in them. I shall fix the number necessary to be distinguished for our purpose to five: 1. the side of the head; 2. that of the neck; 3. the shoulder; 4. the side properly so called, or the lateral part of the breast; 5. the hip.

1023. Either of these five regions may present at the orifice of the *uterus* at the time of labour, though some of them are met with more frequently than others, and they present different indications relative to the mode of operating: for these indications vary not only for each region, and their different positions, but also according as they belong to the right or left side of the body. The better to demonstrate all the difference between the same regions on the opposite sides of the body, after having stated what relates to any position of a region of the right side, I shall immediately treat of the same position of the left side. I shall not hesitate even to repeat what I have said before, if necessary to develop the mechanism of these labours more clearly. These bad situations of the child depend on the concatenation of several causes, which would be difficult always to determine: an obliquity of the *uterus*, and the great quantity of water which sometimes surrounds the child, favour them all, and seem sufficient to occasion some of them, independently of any other cause.

1024. The diagnostic of these labours is not more difficult to distinguish, than those described in the preceding chapter; and the prognostic of them, *cæteris paribus*, must also be the same.

Labours in which the Child presents the right or left Side of the Head. Of their Causes, Signs, Differences, and Indications.

1025. These labours may be the effect of the general causes stated in par. 1024, or of one of them only: for the great diameter of the child's body cannot be parallel to the axis of the *pelvis*, when the *uterus* is much inclined in any direction, or when it contains a large quantity of water.

1026. We may easily distinguish the lateral parts of the head, especially after the evacuation of the waters. We then find a solid roundish tumour at the entrance of the *pelvis*, in which we can touch neither the anterior nor the posterior *fontanelle*. If we meet with any thing like them, it is those membranous spaces which are found at the bottom of the *lambdoidal* and *coronal sutures*. But the ear, which is the most salient part of it, clearly demonstrates it to be the side of the head that presents. We have then nothing to do, but to examine whether it be the right or left side: to distinguish which is very essential, in order to determine the best mode of operating. To make this distinction, we must carefully observe the relation which all the abovementioned marks have to the *pelvis;* as we shall see in the following position, which will serve for an example.

1027. In the first position of the sides of the

head, which is far from being the most common of the four I am going to describe, the *vertex* is over the edge of the *os pubis*, against the anterior part of the *uterus*, and the base of the *cranium* towards the *sacrum;* so that the face is towards the left *iliac fossa* when the right side of the head presents, and towards the right *iliac fossa* when it is the left side: which we may distinguish by the situation of the posterior edge of the ear, that of the angle of the lower jaw, or of any other of the marks with respect to the *pelvis*. We may be certain that it is the right side of the head which presents in the first position, if we find the posterior edge of the ear toward the right side of the *pelvis*.

1028. In the second position, which is the most frequent, the *vertex* is situated transversely over the union of the *sacrum* with the *vertebral column*, and the base of the lower jaw or the neck over the *pubes:* the face is towards the right *iliac fossa* when the right side of the head presents, and towards the left when it presents the left side.

1029. In the third position the *vertex* answers to the lower part of the left *iliac fossa*, and the base of the lower jaw to the right; so that the face lies transversely over the *sacro-vertebral symphysis* when the right side of the head presents, and under the anterior part of the *uterus* when it is the left side.

1030. In the fourth position the *vertex* answers to the right *iliac fossa*, and the base of the *cranium* to the left; so that the face is situated under the anterior part of the *uterus*, over the *pubes*, when it is the right side of the head, and over the *sacro-vertebral symphysis* when it is the left.

1031. It must be remembered that the head cannot present one of its sides at the orifice of the *uterus*, without being bent on the opposite shoulder.

It will then lie against the left shoulder whenever it presents the right side, and on the right shoulder when it presents the left. This remark itself indicates what ought to be done in all these cases, to restore Nature to her rights, and enable her to perform the delivery.

1032. Labours in which the child presents one of the sides of the head present different indications, according to the circumstances which complicate this bad position. Sometimes they consist in reducing the head to its natural situation, in order to commit the expulsion of the child to the forces of the mother; and sometimes in turning it, to extract it by the feet.

Method of operating where the Child presents one of the Sides of the Head.

1033. The first of these species of labour presents one of those cases in which it might be proper to place the woman on her elbows and knees, if any advantage were ever to be expected from that situation; because it seems the most likely to restore the head to its natural position: but it is so inconvenient, that the woman cannot continue in it any time, and therefore we ought never to prescribe it. It is better to keep the woman on her back, and introduce one hand to the entrance of the *uterus*, to remove the base of the child's *cranium* from the projection of the *sacrum;* while with the other we press more or less on the *hypogastric* region, to force down the *vertex* towards the centre of the superior *strait*. If we cannot compass this first intention, which is to reduce the head to its natural situ-

ation, we must turn the child and bring it by the feet, as we also must whenever the labour is complicated with any of those accidental circumstances which I have repeatedly mentioned.

1034. To turn the child when the right side of the head presents, we must introduce the right hand into the *uterus*, towards the left *iliac fossa*, where the face is, in order to remove the head from that side, and push it towards the right *iliac fossa:* then we search for the feet, and finish the delivery in the same manner as in the second species, where the *vertex* presents.

1035. When the left side of the head presents in the first position, we must operate with the left hand. It must be introduced towards the right *iliac fossa*, where the face is, to direct the head over the left *iliac fossa*, and search for the feet as in the first position of the *vertex*.

1036. I have already observed that the position of the head, which constitutes the second species of these labours, is the most common of the four, into which they are divided. It cannot occur but when the *uterus* is very much inclined forward; and experience has frequently convinced me, that in most cases, diminishing the obliquity of the *uterus*, by laying the woman on her back, and as horizontally as possible, is sufficient to restore the head to its natural situation. If this precaution fail, we must endeavour to procure the change of position, by introducing one of the hands into the *uterus*, above the base of the *sacrum*, to hook the *vertex* which lies there, and bring it to the centre of the entrance of the *pelvis*.

1037. When particular circumstances do not permit us to commit the delivery to Nature, but require us to terminate it immediately, we must turn

the child, and extract it by the feet. In that case, if the right side of the head presents, we use the left hand, which must be introduced above the *vertex*, to rectify the position of the head, as I have just directed; while with the other hand we press more or less on the woman's belly, to diminish the anterior obliquity of the *uterus*. After that, we search for the feet in the same manner as if the *vertex* had presented in the first position.

1038. If we find the left side of the head at the orifice of the *uterus*, we operate with the right hand. We begin, as before, by bringing down the *vertex* to the superior *strait;* and then push the head over the right *iliac fossa*, in order to search for the feet, as in the second position of the *vertex*.

1039. We cannot call to mind the position of the head which constitutes the third species of these labours, without perceiving that it is more difficult to reduce it to its natural situation, than in the preceding case. To procure that reduction, when the right side of the head presents, we must remove the child's face from the base of the *sacrum*, by advancing the right hand in the neck of the *uterus*, while we make a pressure with the other on the *hypogastric* region of the woman, to force the *occiput* down towards the middle of the *pelvis;* and we must direct the woman to lie a little on the left side, to incline the *fundus uteri* that way.

1040. We must in some respects proceed in the same manner in the third position of the left side of the head, if we attempt to reduce it to its natural situation. But it is much more easy to perform than in the preceding case, because the *occiput* rests on the base of the *sacrum*, and we can carry the hand directly upon it, to bring it down to a proper situation at the entrance of the *pelvis*.

1041. When circumstances require us to turn the child, and bring it by the feet, we use the right hand, if the right side of the head presents. It must be introduced along the *sacrum* and under the child's face; we raise the head, carrying it forward, and at the same time towards the right *iliac fossa;* then search for the feet as in the second position of the *vertex;* and finish the delivery as directed in that species of labour.

1042. We may also operate with the right hand in the third position of the left side of the head. We slide it up under the *occiput* which rests against the base of the *sacrum*, and proceed at first as if we only intended to reduce the head to its natural situation: but at the same time carrying it on the forepart of the right *iliac fossa*, in order to search for the feet, in the same manner as in the preceding case. After having brought them to the entrance of the *vagina*, we must observe to pull a little stronger on the left foot for a few seconds, in order to favour the movements of the *trunk* necessary for the descent of the *breech.* The rest of the operation must be conducted as usual.

1043. We might also operate with the left hand in this third position of the left side of the head; but we must slide it up towards the right *iliac fossa* of the mother, and push the head towards the other, in order to search for the feet by passing the hand along the left side of the child. If this method, which is more difficult than that described in the preceding paragraph, should be preferred, we must pull almost entirely on the right foot, after they are both brought into the *vagina;* to accomplish the same views as were intended before, when I directed the greatest force to be exerted on the left foot.

1044. When the right side of the head presents

in the fourth position, we may reduce it to its natural situation without much trouble, by introducing one hand under the *occiput* which rests against the base of the *sacrum*, and bringing it to the centre of the superior *strait*, while with the other we incline the *fundus uteri* a little towards the right side. When it is necessary to turn the child, and extract it by the feet, we may use either the right or the left hand. If we prefer the former, we must direct it towards the left *iliac fossa* of the mother, to search for the feet along the right side of the child: and when they are both brought to the entrance of the *vagina*, we must pull chiefly on the left foot, to facilitate the conversion of the *trunk*, and the descent of the breech in a proper direction. The rest of the delivery to be conducted as usual.

1045. If we use the left hand, we must insinuate it along the *sacrum* under the *occiput*, to bring it to the centre of the superior *strait*, as if we only wanted to reduce the head to its natural situation; we then remove the head from the entrance of the *pelvis*, pushing it over the forepart of the left *iliac fossa*, and then search for the feet along the child's left side. As soon as they are both disengaged from the *uterus*, we pull only on the right foot, to bend the *trunk* more easily on its anterior part, and favour the descent of the breech; after that we pull equally on both feet, and finish as in the preceding case.

1046. To reduce the head to its natural situation, when the left side of it presents in the fourth position, we introduce one hand at the entrance of the *uterus*, and backward, to raise the face which lies against the base of the *sacrum;* while with the other we exert a pressure on the *hypogastric* region of the woman, strong enough to force the *occiput* down towards the superior *strait*. Having accom-

plished this purpose, we may turn the woman a little on her right side, to rectify the axis of the *uterus*, too much inclined to the left, and make it parallel to that of the *pelvis;* then leave the delivery to the efforts of Nature.

1047. When we cannot reduce the head to its natural situation, or accidental circumstances require immediate delivery, we must turn the child, and extract it by the feet. For that purpose we must introduce the left hand in a state of *supination*, towards the posterior part of the *uterus*. We remove the face as we go along from the base of the *sacrum*, on which it rests transversely, carrying the head at the same time on the fore part of the left *iliac fossa*. Then we trace the left side of the child, to take hold of the feet, and finish the delivery according to the rules prescribed for the other positions.

Labours in which the Child presents one of the sides of the neck. Of the Causes, Signs, and Differences of these Labours.

1048. Labours in which the child presents one of the sides of the neck, are less frequent than the preceding, though they proceed from the same general causes: which we must doubtless attribute to the particular form of those regions.

1049. It is impossible to distinguish the lateral parts of the neck, and judge of their situation relatively to the *pelvis* of the mother, before the opening of the membranes; nor then, without introducing the whole hand into the *vagina:* but we ought not to make such an examination till it is time to deliver; that is to say, till the parts of the woman are well prepared, and the pains very strong.

1050. This region itself offers no sensible mark to the touch, whereby we can distinguish it from others. It is only by the top of the shoulder, the *clavicle*, the angle of the lower jaw, and the lower part of the ear, which circumscribe it, that we can discover it; it can never present at the orifice of the *uterus*, without the greater part of these marks being near the circle of it.

1051. In the first position of either side of the neck, the ear and the angle of the lower jaw are placed on the edge of the *os pubis*, and the shoulder is over the base of the *sacrum*. The face is towards the left side of the mother when the right side of the neck presents, and *vice versa*.

1052. In the second position, the angle of the lower jaw and the ear are situated against the base of the *sacrum*, and the shoulder is over the *pubes;* so that the face answers to the right *iliac fossa* when the right side of the neck presents, and the left *iliac fossa* when it is the left side.

1053. The child is placed transversely over the *pelvis* in the two other positions. In the third, the side of the head is found resting on the left *iliac fossa*, and the shoulder on the other. The face answers to the *sacro-vertebral symphysis* when the right side of the neck presents, and to the anterior part of the *uterus*, over the *os pubis*, when it is the left side.

1054. In the fourth position, the side of the head rests on the right *iliac fossa*, and the shoulder on the left; the face is placed transversely over the *pubes* if the right side of the neck presents, and over the *sacro-vertebral symphysis* when it is the left side.

Of the Indications, presented by these labours, and the Mode of operating in them.

1055. We have nothing to expect from the forces of the mother, when one of the sides of the Child's neck presents at the orifice of the *uterus*, except after we have brought the head or the feet to the passage. But it is always so difficult to accomplish the first of these indications, that I would advise it never to be attempted, but to search for the feet in all these cases.

1056. The manner of operating is absolutely the same as in the different species of labours where one of the sides of the head presents. We must proceed in each position of the right side of the neck, as in that of the right side of the head described by the same numerical name; and in the different situations of the left side, we must follow the directions given for those of the left side of the head.

Labours in which the Child presents one of the Shoulders. Of their Causes, Signs, Differences, and Indications.

1057. Though these labours seem to depend on the same causes as the preceding, they are nevertheless much more frequent; which no doubt arises from the shoulder's being more salient and rounded, whereby it accommodates itself better to the form of the entrance of the *pelvis*, than the side of the neck can.

1058. It is easy enough to discover the shoulder by the touch; by the *clavicle*, the angle of the *sca-*

pula, the arm, and the ribs. When the hand comes down, it sufficiently denotes the presence of the shoulder at the orifice of the *uterus*, and may also demonstrate, in what manner it is situated, and whether it be the right or left shoulder.

1059. The shoulders may present in different positions at the orifice of the *uterus*. In the first, the side of the neck rests on the edge of the *os pubis*, and the side of the breast over the *sacrum;* so that the fore part of the breast is towards the left *iliac fossa* when the right shoulder presents, and towards the right *iliac fossa* when it is the left shoulder.

1060. In the second position, the side of the neck is over the superior edge of the *sacrum*, and the side properly so called is over the *pubes;* the breast answers to the right *iliac fossa* when the right shoulder presents, and *vice versa*.

1061. In the third, the neck and the head rest on the left *iliac fossa*, while the side and the hip are over the right; so that the back is placed transversely under the anterior part of the *uterus* when it is the right shoulder, and on the posterior part of that *viscus* when it is the left.

1062. The child is also placed transversely in the fourth position of the shoulder; but the head lies in the right *iliac fossa*, and the lower part of the *trunk* over the left; the breast is under the anterior part of the *uterus* when it is the right shoulder, and over the *sacrum* when is is the left.

1063. The indication in these labours is easy to perceive: it consists in extracting the child by the feet. In all these cases we should be little founded in advising the reduction of the head to its natural situation.

Method of operating when the Child presents the Shoulder.

1064. When the child presents the shoulder in the first of the four positions stated above, it is by no means indifferent whether we introduce the right hand or the left into the *uterus* to search for the feet; especially when the waters have been some time evacuated. The right hand is exclusively proper when it is the right shoulder; and *vice versa*. In the first case we slide the hand along the posterior and left lateral part of the *uterus*, removing the shoulder from the entrance of the *pelvis*, pushing it as much as we can over the right *iliac fossa;* in order to get hold of the feet, and bring them successively into the *vagina*. If we meet with any difficulty in bringing them entirely down, after having brought them so far, we must remember to remove the shoulder again from the superior *strait*, in the same manner as I have frequently recommended the head to be removed from it.

1065. When the left shoulder presents, we introduce the left hand along the posterior and right lateral part of the *uterus,* in order to turn the child. We first remove the shoulder from the entrance of the *pelvis*, pushing it towards the left *iliac fossa*, and proceed in the rest of the operation with the same precautions as in the preceding case.

1066. In the second species, if the right shoulder presents, we introduce the left hand along the right lateral part of the *uterus*, in order to find the feet, and turn the child in the easiest manner. We remove the shoulder from the entrance of the *pelvis*, as we go along; then the head, which is a little farther off; and direct them towards the left *iliac fossa*,

while we incline the *fundus uteri* a little to the right side, by pressing externally on the woman's belly. When we have reached the feet, we bring them down successively; and if we meet with any difficulty in bringing them entirely down, we must remove the shoulder anew from the superior *strait*. The rest of the operation to be conducted as usual.

1067. We operate on the same principles in the second position of the left shoulder: but we must search for the feet with the right hand. We introduce it towards the left side of the *uterus*, and remove the head and shoulders from the superior *strait* as we go along, directing them over the right *iliac fossa;* while we incline the *fundus uteri* to the other side, by making a convenient pressure on the woman's belly. After that we bring down the feet with the usual precautions, and finish the operation as in the preceding cases.

1068. When the right shoulder presents in the third position, we must introduce the right hand along the posterior part of the *uterus*, passing it under the child's breast, which we must remove from the *lumbar column* of the mother, carrying it over the *os pubis*, till the shoulder be entirely disengaged from the superior *strait;* we then search for the feet, directing the fingers along the right side of the child. When they are brought down to the entrance of the *vagina*, we must pull a little while almost entirely on the left foot, taking hold of it with the fingers only, while with those of the other hand we push the shoulder farther and farther above the *os pubis*, in order to favour the flexion and rotation which the *trunk* should execute, that the breech may engage more freely. Afterwards we pull equally on both feet, and continue to extract the child, as if those extremities had presented naturally.

1069. When the left shoulder presents, in order to find the feet easily, and bring them down in the most favourable manner, we must introduce the left hand, nearly in a middle state between that of *pronation* and *supination*, along the left side of the child, and the anterior and right lateral part of the *uterus*, till the fingers meet with them. We then bring them down successively, beginning with that belonging to the side which the hand has passed over, but taking care to make them both pass over the child's breast. We then pull almost entirely on the right foot, while with the fingers of the other hand we push the shoulder up above the projection of the *sacrum*. Afterwards we act equally on both feet with the usual precautions.

1070. The method of operating is not more indifferent in the fourth position of each shoulder, than in that which I have just described. When the right shoulder presents, we must introduce the right hand along the anterior and left lateral part of the *uterus*, bending it a little over the *pubes*, till the fingers can hook the feet, to bring them down successively, beginning with the right foot, and making them pass over the child's breast, behind the *pubes* of the mother. As soon as they are both in the *vagina*, we pull only on the left foot, while we push the shoulder upward and backward, with the ends of the fingers, as recommended in par. 1069; especially if we find any difficulty in bringing down that foot. We then act equally on both extremities, till the breech is engaged, and finish the operation as in the other cases.

1071. When the left shoulder presents in the fourth position, we must slide the left hand into the *uterus*, carrying it in a state of *supination* under the child's breast. We disengage the shoulder by lifting

it up above the edge of the *os pubis;* we afterwards direct the fingers towards the right side of the woman, tracing along the left side of the child, passing successively over the hip and thigh to the foot: having brought the latter into the *vagina*, we pass the hand again into the *uterus* to bring down the other; when it is brought as low as the first, we continue to pull on it till the breech is engaged. After that we pull on both equally, and extract the child according to the precepts already given.

Labours in which the Child's Hand presents first.

1072. I THOUGHT it better to class those labours in which the child presents one of its hands, under this article, than any other, though the hand may present when the shoulder is not placed over the entrance of the *pelvis:* because in those cases the hand rarely escapes alone from the *uterus;* which, on the contrary, very often happens in the different species of labour which make the subject of the two preceding sections.

1073. Among the precepts which have been transmitted to us concerning these labours, there are many which are contrary to the principles of the art, and to those sentiments of humanity with which all men ought to be endued. Nothing can excuse the cruel practices which have been so often exercised on those unfortunate children who present the arm first, especially that which is but too frequently done at the present day.

1074. To throw more light upon what concerns these labours, I shall distinguish the different circumstances in which the hand may present; because we must not act in the same manner in all of them.

1075. The hand often presents at the orifice of the *uterus* before the membranes are open; at other times it does not appear and engage in it till long after the waters are discharged. The hand almost always accompanies the head in these circumstances, and cannot advance without the head's engaging in the *pelvis* at the same time: sometimes it appears along with the breech, or any other region of the child's surface. If it oftener denotes the presence of the shoulder at the orifice of the *uterus*, when it is descended very low, it is because the shoulder presents oftener than most of the other regions, the head, the breech, and the feet excepted.

1076. It is very rare that the presence of the child's hand obstructs delivery, when it accompanies the head, the breech, or the feet, at the orifice of the *uterus*, if the woman's *pelvis* be well formed; because in that case it is larger than is necessary for the passage of a head of the usual size. In most women, when the hand engages with the head, and continues to advance before it, it produces but feeble obstacles to the progress of labour, and even those obstacles do not exist every time it presents before the membranes open, or at the instant of their opening; because it generally recedes of itself, and the head engages alone: it is easier to explain this effect, than to comprehend why it does not always happen in similar cases.

1077. But though the presence of the child's hand can generally oppose but feeble obstacles to the descent and exit of the head, it is however right to prevent them; and it is better to push it back than let it come down, when we discover it betimes. I have often demonstrated, in presence of my pupils, that supporting the child's hand with the extremity of a finger, pressing it against the head, and direct-

ing it towards the face, while the head itself engaged in the superior *strait*, was sufficient to make it disappear. We do not push it up, but hinder it from coming down, till the head has got under it; after which it will go up of itself. We must never attempt to push it back when the head is low down in the *pelvis;* but, if it visibly obstructs delivery, remove the arm from the side of the cavity, towards one of the *ischiatic notches.*

1078. It is only when the *pelvis* is defective, and a little narrow, that the exit of the child's hand can produce great obstacles to that of the head at the same time. But then there is the utmost necessity of pushing the hand above the head, if the time be not past; that is to say, if the head be not too far advanced, and wedged among the bones of the *pelvis:* for in that case it is sometimes better to deliver with the forceps.*

* I find several examples of the application of the crotchet in similar cases; but only one of the application of the forceps, and that was after the *cranium* was perforated, and the brain evacuated. The two following cases tend to demonstrate that the presence of the arm does not prevent the use of the latter instrument, and that its utility is not less evident in this than in many other circumstances.

The 29th of January, 1776, I was called to a woman of low stature, the small diameter of whose *pelvis*, was at most but three inches and a quarter at the brim. She was at her full time of her first child, and had been in labour twenty hours; eighteen hours had elapsed since the waters were evacuated, and the pains were very strong. The child's head presented well, the *occiput* being turned towards the left *acetabulum;* but it was scarcely at all engaged, though the great tumefaction of the scalp made it appear far advanced. The fore-arm placed on the right side, and strongly pressed behind the *pubes*, made a deep depression in the scalp, like a gutter, and was itself so strangulated, that the hand was swelled in an extraordinary manner, and very livid. The labour having been very severe, her pulse was quick and hard, her face inflamed,

1079. It very rarely happens that both hands present with the head, and more rarely still that we are obliged to push it back, and turn the child, on account of this slight complication, so easy it is to

respiration difficult, and the *abdomen* hard and painful. After having bled her a second time, for she had been bled three hours before, I endeavoured to push back the child's hand; but not being able to do it, and presuming that, if I could, she would not be delivered without a great deal of difficulty, on account of the narrowness of the superior *strait*, and the exhausted state of her strength; and foreseeing also too much danger in turning the child, and bringing it by the feet, I applied the forceps. I conducted them as I have directed for that position of the head, sliding the branches to the height of seven inches at least, in order to take hold of it properly, having first pushed it up above the *strait*, to give more liberty for their application; and I brought the child alive: though it appeared a little fatigued, it so well recovered by the methods I used, that an hour after its birth it was as strong as any other. M. Legrand, D. M. Professor of Midwifery at Amiens, was present at this labour.

My brother applied the forceps in a similar case, June 25th 1785, in presence of two foreign physicians and surgeons, correspondents of the Royal Academy of Surgery at Paris, Messrs. Audiberty and Assaliny, who then attended my lectures. The child's hand had been without more than five hours; the arm appeared as far as the elbow, was swelled, livid, and cold; it came down on the right side of the *pelvis*, and a little behind the *pubes*. The head, large and solid, occupied the lower part of the *pelvis;* it had cleared the neck of the *uterus*, and had a a tumor on the *vertex*, which entirely concealed the *sutures* and *fontanelles*, and prevented a discovery of its true situation. The woman was weak, and had a very small pulse: the *labia pudendi* were swelled, inflamed, and covered with vesicles. On one side, the woman was in danger of sinking before she was delivered, if it were not performed quickly; on the other, there was as great a risk of the child's life from any hasty measures, and the head could not be pushed back to bring it by the feet. My brother determined to use the forceps, and by their help preserved the lives of both. In four days, the tumefaction of the hand, the fore-arm, and head of the child was dissipated, and on the fifth the woman could sit up.

remedy it. We ought not to recur to that often dangerous expedient, but when we cannot re-establish the head in its natural situation, after having returned the hand into the *uterus*.

1080. The presence of the hand or the arm at the orifice of the *uterus*, in whatever direction it may be, presents no particular indication before the opening of the membranes; and afterwards we have only to consider the principal region of the child which presents, and its position, to determine the mode of operating.

1081. Some have imagined that they could extract the child by pulling at the arm; others that we ought to return the arm into the *uterus*, in order to turn the child, and extract it by the feet. Some have torn off the arm, and even both of them, by twisting them round till they pulled them away from the body; and some, from a principle of humanity, have amputated the arm as high as possible, with sharp nippers, or otherwise, thinking amputation less cruel than tearing it off; or have contented themselves with making deep incisions into it, with a view of lessening its size, when it has been tumefied, and appeared gangrened. An accoucheur of the last age* advised passing a fillet round the body, by means of a blunt hook pierced, to bring down the breech, while the breast is pushed up; and in our days, another has proposed to search for the child's other hand, when we cannot penetrate the *uterus* to find the feet.†

1082. Those who know the relation which the dimensions of a child at full time, whose arm is

* Peu, Pratique des Accouchemens, p. 412.

† M. de Leurie, Traité des Accouchemens, edit. 2, p. 311, & suivans.

out of the *uterus*, bear to those of a *pelvis* of the natural size, will see clearly what is to be expected from efforts exerted on that extremity, with a design to extract the body. If delivery has sometimes been terminated in that manner, it was because the child was very small, and the mother's *pelvis* large enough to let it pass double: these examples are extremely rare, and cannot serve for general rules.

1083. Returning the arm into the *uterus*, would be much more laudable, if it could be done in all cases: but except when the waters are recently drained off, we cannot accomplish it; and all attempts for that purpose would be dangerous in proportion to the force employed.

1084. The reduction of the arm, always difficult, and generally impossible, is not essentially necessary in any of these cases. It is not the presence of that extremity engaged in the passage, which opposes the introduction of the accoucheur's hand; that could not of itself hinder it from penetrating to search for the feet, and turn the child. It is the contraction of the *uterus* itself, the hardness of its neck, and the little dilatation of its orifice, which are the obstacles, if any are met with. It is easy to convince ourselves of this truth, if we consider the natural size of the woman's *pelvis*, the extreme dilatation of which the orifice of the *uterus* is susceptible, and that which it undergoes in all labours; and especially by comparing its dimensions when fully dilated, with the hand of the accoucheur added to the child's arm.

1085. The bigness of the arm, even when swelled to the greatest degree, can never entirely fill the passage, and that extremity, joined to the operator's hand, never surpasses the size of the breast or head of the child. Now if the orifice of the *uterus* is sus-

ceptible of so great a dilatation, and the *pelvis* is naturally large enough to give a passage to those parts; if we have seen them clear this double passage, though preceded or accompanied by an arm, or one of the inferior extremities, as in those labours where the child comes with the breech foremost; how is it possible to believe that the arm, either in its natural state, or swelled, can oppose the entrance of the accoucheur's hand into the *uterus?* How has it been possible to persuade sensible persons, that the arm could entirely block up the passage, that it was right to amputate it, or tear it off, and that that operation was necessary?

1086. When we proceed to deliver at the moment of the evacuation of the waters, if the neck of the *uterus* is supple, and its orifice well dilated, we introduce the hand into it, and turn the child with as much ease as if the arm had not come down. In some cases, where the presence of the arm has seemed to oppose the greatest obstacles to the introduction of the hand, a sudden flooding has removed those obstacles, and given an opportunity of terminating, without farther trouble, a labour whose difficulties began to be looked upon as beyond the salutary resources of the art, from the repeated efforts that had been made in vain to surmount them. But what more could that hæmorrhage do, than relax the neck of the *uterus*, weaken its resistance, and dissipate the natural or spasmodic contraction of the whole body of that *viscus?* And what is there in that which art cannot operate with less danger than Nature has sometimes done it with accidentally?

1087. The true indication in all these cases consists in procuring this suppleness in the fibres of the *uterus*, whenever they do not enjoy that favourable

and even necessary disposition for delivery, before we attempt to turn the child, whether the arm present or not. By accomplishing this first intention, the accoucheur will prepare himself an easy access to the child's feet, and will no longer think himself in the melancholy necessity of tearing off or amputating the arm of the unfortunate infant. He will also be convinced that it is not necessary to return it into the *uterus*, in order to finish the delivery.

1088. Even the putrefaction of the arm, which might seem to leave no hope for the child but in amputation, cannot authorize us to practise it before delivery; because if it be indispensable, it can be done much better afterwards, than while the child is inclosed in the womb. Those practitioners who have taken off this limb, only because they thought from its putrefaction that the child was dead, will not appear less culpable in the eyes of the skilful, who know that this putrefaction is often only local, that it is no certain sign of death, and that many who thought they were only mutilating a dead carcase, have mutilated, and afterwards extracted, a living child. Those examples show us with what caution we ought to proceed in all these cases.

1089. Whatever may be the state of the arm come down, it always requires less attention than the state of the body and neck of the *uterus*. If that has not been fatigued by ineffectual efforts, or by imprudent hands, if its neck is supple and well dilated, we must introduce the hand into it, according to the rules laid down for each position of the shoulders, in order to search for the feet, and turn the child, in the same manner as if the arm were not come down.

1090. When the *uterus* is in a state of spasm, which is not very common, or is already strongly contracted on the body of the child, it must be soft-

ened and relaxed by proper methods, such as bleeding at the arm, baths, &c. And we ought never to attempt to deliver, till we have satisfied this first indication, which is always the most urgent in these cases. I must observe here that we ought not to be afraid of letting blood copiously, when the case requires it, by repeating the bleeding at the arm; but that it would be dangerous to take for a rule on this subject the advice given by a young physician in 1774, at that time scarcely initiated in the elements of midwifery.* Experience had not yet taught him how much was to be hoped or feared from those repeated bleedings, which he looked upon as the sheet anchor of the woman.†

* M. Alphonse le Roy, Journal de Médicine du mois de Mars 1774. This was the first year that he began to practise and teach the art of Midwifery.

† I cannot pretend to determine how frequently Le Roy has advised bleeding to fulfil the intended indication laid down, never having seen the work alluded to; but must differ from our author, when he supposes the necessary relaxation may be procured by other means than blood-letting; I believe it to be the only remedy that can with certainty be employed, where local inflammation, fever, and rigidity accompany the labour. But I agree, it should not be done by repeated bleedings; as I rather believe them ineffectual, if not sometime mischievous. If any benefit is to be derived from bleeding, it must be performed quickly and extensively; by quickly, I mean, a large quantity drawn in a short space of time; for this purpose, a large vein and a large orifice are necessary; by extensive bleeding, I wish to be understood, until the patient become sick or faint, or at least until the *uterus* is sufficiently relaxed. This happy disposition of the *uterus* is sometimes obtained in a few minutes by a large bleeding, as I have demonstrated to my pupils in several instances. I have obliged one of them to introduce a finger into a rigid *os uteri*, while I drew blood from the arm, and my rule for stopping was *syncope*, an approach to it, or until I was informed by the person touching, that the *uterus* was sufficiently dilated. W. P. D.

1091. A state of spasm, or a strong contraction of the *uterus*, are not the only causes which may hinder us from passing the hand into it, in order to turn a child whose arm is without. Frequently we cannot do it, merely because the orifice of the *uterus* is but very little dilated, at the time that extremity comes down, and its edge is still too thick and rigid to permit it to open farther, without great inconveniences; because the membranes have burst prematurely, and the pains have not yet had time to procure the requisite dilatation. All attempts to deliver immediately would not be less dangerous in this case, than when the *uterus*, fatigued by the length of the labour, or affected by a spasm, strongly opposes the entrance of the hand. They would only augment the difficulties naturally attendant on this epoch of labour, either by exciting the contraction of the neck of the *uterus*, or by depriving the parts of the woman of the *mucus* designed by Nature to soften and relax them, rendering them painful, and disposing them to inflammation, or by accelerating the tumefaction of the child's arm: which would render the case, already sufficiently disagreeable in itself, much more so. We must then wait till the fibres which constitute the edge of the orifice of the *uterus* are moistened, weakened and relaxed; in one word, till they acquire the necessary degree of suppleness for the requisite dilatation, or till that dilatation take place spontaneously, before we attempt to operate. During this delay, we ought to avoid touching the woman too frequently, as some do with a view of assisting the dilatation, lest we should produce the contrary effect. If the resistance of the neck of the *uterus* does not yield to the natural efforts of labour, bleeding at the arm, baths, and emollient injections may be of great use. We may give it the

necessary time, because the presence of the arm never of itself offers any very urgent indication.*

1092. From I have said concerning labours in which the child's hand is without, and the arm engaged in the orifice of the *uterus*, we may establish the following principles: 1. That in all these cases we ought to attend more to the state of the *uterus*, than to that of the extremity of the child, which of itself presents no essential indication, except sometimes after delivery, when it happens to be tumefied, livid, or gangrened: 2. That we ought never to attempt to return it into the *uterus* when the waters have been sometime evacuated: 3. That its reduction, though possible at the time the membranes open, that is, at the instant of its escape from the *uterus*, is not essentially necessary: 4. That it is contrary to the principles of the art to tear off or amputate the limb: 5. That it would be absurd when the child is living to think of extracting it by pulling at its arm, as well as to attempt to search for the other hand, when the strong contraction of the *uterus*, and the little dilatation of its orifice prevent our entering it to search for the feet: 6. That it would not be

* I would observe here, I believe it to be the best practice not to wait too long for the powers of nature to relax the *uterus*, after the arm has come down; as they are very often tardy, and in some instances never accomplish the object. I conceive it a duty to relieve the woman as quickly as possible. Inflammation very soon comes on in these cases, more especially where the woman has been officiously touched; to act as quickly after the escape of the waters as the *uterus* will allow, is not only desirable, but sometimes essential to the welfare of the child; therefore as we have a remedy at hand, namely, copious bleeding, I think it best to employ it. Should it not be immediately successful, which, by the by, will very rarely happen, it will at least, very much hasten the desired object.
W. P. D.

rational in these cases, to hook the other hand and pull at it, in order to change the position of the child's *trunk*, even if it should be near enough to the orifice to be brought out by insinuating some of the fingers only into it: 7. That we must always search for the feet and turn the child, but that it would be dangerous to attempt it before the parts of the woman are well prepared for it, either by nature or art.

1093. It often happens in these cases, that the child's hand disappears, and seems to return into the *uterus*, in proportion as the feet descend, this effect, the cause of which is easily discovered, is not always fortunate for the child. If the arm sometimes places itself so in the *pelvis*, as afterwards to rise to the side of the head, in the same manner as when the child presents the feet naturally; at other times also, the arm folds in the *pelvis*, and the elbow buts against some point of the sides of that cavity, and obstructs the descent of the *trunk*, or else exposes the *humerus* to be fractured.

1094. To avoid these inconveniences, we must take care to make this extremity descend in the same proportion as the *trunk*. Therefore if it disappear entirely, as soon as the thighs are disengaged, we ought to search for the hand again, and keep it extended along the side of the body. It would however be more certain and expedient to apply a fillet on the child's wrist, before we search for the feet, as I have recommended long since, in a little work published for midwives. We may reap a double advantage from this fillet; 1. That of fixing the child's arm lengthwise against one of the sides of the *pelvis*, in order to prevent its folding in that canal, while we introduce the hand into the *uterus*, to search for the feet; 2. That of preventing the inconveniences stated in the preceding paragraph. If we

employ the fillet, we must take care not to pull it while we endeavour to bring down the feet, lest we fix the shoulder at the entrance of the *pelvis*, at a time when it must necessarily recede from it; but remember to do it as soon as the breech is engaged in the passage.

Labours in which the Child presents one of its Sides. Of their Causes, Signs, Differences, and Indications.

1095. *Cause.* The same as for the back and loins.

Signs. The ribs, the *axilla*, the arm, the hips; the right or left side may be distinguished by attending to the situation of these parts with respect to the *pelvis*.

Indication. Turning and bringing by the feet.

Varieties. 1. The *axilla* of either side may rest on the *pubes*, and the hip over the *sacrum;* the breast towards the left *iliac fossa*, when the right side presents, and *vice versa* when the left.

Mode of Operating.

If the right side presents we use the right hand; if the left side the left hand; we seize the feet and finish the delivery as directed in par. 1064 for the first presentation of shoulder.

2. The *axilla* over the base of the *sacrum* and hip over the *pubes;* the breast answers to right *iliac fossa* when it is the right side, and *vice versa.*

When the right side presents we use the left hand, and *vice versa;* we grasp the feet and finish the labour as directed for the second presentation of shoulder. See par. 1066.

3. The *axilla* on left *iliac fossa*, the hip on the other, breast to posterior part of the *uterus*, when the right side presents, and *vice versa*.

Mode of Operating.

If the right side, right hand, if the left, the other; finish as in a third presentation of shoulder. See par. 1068.

4. The *axilla* to right *iliac fossa*, the hip on the left; back to the posterior part of the *uterus*, when right side presents, and *vice versa*.

When the right side presents, the left hand must be used, and *vice versa;* finish as in a fourth presentation of the shoulder. See par. 1070.

Labours in which the Child presents one of the Hips at the Orifice of the Uterus. Of their Causes, Signs, Differences, and Indications.

1096. *Cause.* Obliquity of the *uterus*, or a superabundance of the *liquor amnii*, or both.

Signs. Crista of the *ilium*, the last of the false ribs, the *anus*, &c.

Indication. Bring down the feet.

Varieties. 1. Breech over the base of the *sacrum;* the *crista* of the *ilium* against the *pubes;* breast to the left side of the *uterus*, when right hip presents, and *vice versa*.

Mode of Operating.

Right hand when right hip presents, and *vice versa;* finish as directed for breech or feet.

2. Breech against *pubes*, *crista* of the *ilium* to the *sacrum;* breast towards the right side, when right hip presents, and *vice versa*.

When right hip, we use the left hand, and *vice versa;* finish as above directed.

	Mode of Operating.
3. Breech on the bottom of right *iliac fossa*, *crista* of the *ilium* towards the left; the breast to the posterior part of the *uterus*, when the right hip presents, and *vice versa.*	When right or left presents, we first endeavour to change the position of the child by obliging the woman to lie on her right side. If this does not succeed we introduce the left hand and finish as for feet or breech.
4. Breech on left *iliac fossa*, *crista* of the *ilum* towards the right; breast under the anterior part of the *uterus*, when right hip presents, and *vice versa.*	We oblige the woman to lie on her left side; if this fails, we use the right hand to bring down the feet and finish as for feet or breech presentations.

Labours of the third Order, or Laborious.

1097. Although the term laborious may seem to be applicable only to those labours which are exceedingly difficult, and which cannot be terminated without the help of instruments, I shall however make use of it to signify all those which compose this third order, and which could not be performed in a more advantageous manner, than with some of those same instruments. I confess that among those labours, there are many which are less difficult, less painful, and less dangerous than the greater part of those which I have described under the name of preternatural, and even than many of those which are usually considered as natural.

1098. Though the impossibility, or the danger of operating with the hand alone, constitutes the distinguishing character of laborious labours; though the absolute or relative necessity of employing some

instruments to terminate them, establishes a kind of relation among them, yet they present us with very great differences, and their species are not less various than those of the two preceding orders: those differences arise, as we shall see hereafter, from the nature of the circumstances, or accidents, which render those labours impossible or dangerous without the help of instruments; from the diversity of those instruments; from the parts of the mother, or of the child, on which they must be applied; from their mode of acting, and from the consequences of their application, &c.

1099. In order to lay down what relates to this latter order of labours with more clearness and method, I think it right to treat first of the instruments necessary to be employed in them. Some I shall only mention; but I shall dwell on the description, and on the mode of acting of the forceps, and the lever, as being of more general and familiar use.

Of the Forceps, and their general Mode of acting.

1100. The name alone of this instrument might give to those who know its true signification, a general idea of its form and mode of acting; it is besides in such common use, that I might dispense with any description of it. It is a species of pincers or lever, composed of two branches perfectly similar; except at the place of their junction, where we remark, in one of them, a moveable pivot, and in the other, an opening fit to receive it.*

* It will be understood that I speak here only of the French forceps, and particularly of those of *M. Levret.*

1101. From this difference arise the names which serve to distinguish the two parts of the forceps; that which has the pivot is called the male branch, and the other the female.

1102. Each of them represents, in one third of its length, or thereabouts, a kind of spoon, open nearly through its whole extent; round the inner edge of it runs a flattish ridge, which might be effaced with advantage; for though it may give the instrument a little firmer hold on the head, sometimes it hurts the teguments, bruises and tears them, so as to denude the bones. The rest of the branch forms the handle of the instrument, the extremity of which is terminated by a blunt hook, an inch long, and a little curved. We have already seen the benefit which may be derived from these hooks in some particular cases (see par. 935); and they would be much fitter for the use I have made of them in those cases, if they only described a gentle curve, or even almost a right angle with the body of the instrument, if they were a little narrower, more rounded, and terminated somewhat in the shape of an olive.—See par. 935.

1103. The invention of the forceps is not very ancient. Without assigning the exact epoch of it, I shall remark that they were scarcely known before every accoucheur eagerly applied himself to making alterations in them: but not all with the same success. Though some have brought them nearer perfection, others have made them more imperfect. None have laboured more successfully in this way than *Smellie* and *Levret:* so much did they change the form, and extend the advantages of this instrument, that we might even look upon them as the authors of it. Among the corrections they made in it, none is of more importance than the double curve

which they added to it: but it would be difficult to decide, to which of those two equally celebrated men the art is most indebted in this respect.

1104. The English forceps nevertheless differ a good deal from those of *M. Levret*. Those of the latter appear to me more perfect, and have advantages which would be vainly sought in the former. Some changes might however still be made in them: but perhaps, and I perceive it would be so, in perfecting them in one respect, we should render them more imperfect in another. As it is not the instrument which operates, but the hand which directs it, the understanding easily supplies those little defects; and unless they appeared greater, I should leave it to those who are proud of inventing new instruments to correct them.

1105. Some have lengthened *M. Levret's* forceps several inches, and others have effaced the ridge which runs along the interior edge of their blades; others have increased the new curve; while some, by altering the form of its branches, by dividing them, and substituting a number of pieces to the simple pivot which fixed them in their junction, have made it a most complicated instrument, without rendering it more recommendable. If the former have increased the advantages of the forceps, by making really useful corrections in them; the latter have rendered their use more difficult and less certain on some occasions.

1106. The forceps which I prefer are two inches longer than those of *M. Levret:* which renders their new curve much easier.* We shall see in the sequel

* By the new curve of the forceps, we are to understand that which is placed on their edges: so *M. Levret* explains it. The addition in length is not my invention; we are indebted to *M. Pean* for it.

the reasons which lead me to choose them so. Experience has convinced me, notwithstanding the vain clamours of ignorance, that they have no more inconveniences, in skilful hands, than the shorter forceps, and that there are resources in them, in many cases, which cannot be obtained from the latter.

1107. The forceps may be considered as the most useful of all surgical instruments, for no other has, like that, the advantage of preserving the lives of several individuals at once, without hurting either of them; but on that very account, perhaps, no other instrument will appear more fruitful in inconveniences. If it should be proved, and I am not very far from believing it, that the forceps have been more fatal than useful to society, that they have destroyed more than they have saved from inevitable death, I should nevertheless look upon them as the most important discovery that has ever been made in the art of midwifery. Those who regard them as an instrument absolutely dangerous, and entirely useless, neither know their mode of acting, nor the difficulties of the art, and have doubtless judged them according to the abuse which they themselves have made of them; and have forgot that the most salutary instrument often becomes murderous in the hands of ignorance and prejudice.

1108. The use of the forceps has bounds, beyond which they become useless, and even dangerous; and the manner of using them is not arbitrary. Their application is subject to certain rules, and it is on the strict observation of those rules, that the advantages to be expected from them depend. When applied without method, or principles, far from obtaining the good expected from them, they sometimes only serve to perpetuate the obstacles, and even to augment them in proportion to the efforts

made to conquer them; and, in many cases, we cannot terminate a labour by their assistance, which Nature would easily have done, if she had not been counteracted.

1109. The forceps were at first proposed only to extract the head stopped in the passage, in those cases where it was suspected to be locked; if we consider their form, dimensions, and relation to all the other parts of the body, we shall see, in fact, that they are proper only in that sort of cases; but their use, then too limited, is since become a little more general. Besides that practitioners have recommended them for taking hold of the child's head above the *pelvis*, when it cannot engage in the passage; others have prescribed them for extracting it after the exit of the *trunk*, and for disengaging the breech, when it is too far advanced and too closely wedged, to be expelled by the natural powers, or to be pushed back to search for the feet.

1110. If the forceps may be reckoned among the resources of the art in this latter case, it can only be as a means of extracting the breech, but not of saving the child's life. If they should be applied in that case, what disorders would they not produce within the breast and *abdomen?* The extremities of the forceps acting on the sides of those cavities, reduces them tranversely to the breadth of an inch and a half, or two inches, if we grasp them sufficiently tight, to get a proper hold for extracting the child; as I have proved on a great number of dead children. We often fracture some of the ribs, strongly compress the *viscera*, and contuse the liver, which is very voluminous at that epoch, if we advance the blades to that height, on the child's sides; and if we do not, it would be vain to expect a firm hold with the instrument.

1111. Even the death of the child, if we could be certain of it when the breech is strongly wedged in the passage, though it would destroy the apprehensions of danger from the pressure, ought not however to determine us in favour of the forceps; because there are other methods more simple, and a great deal more certain. The forceps themselves present them to us in the extremities of their branches: the blunt hooks, which terminate them, are exceedingly convenient in these cases, and might be made much more so by means of the little alterations suggested in par. 1101.

1112. The forceps then ought never to be applied but with a view to extract the head; and their advantages and inconveniences are proportionate to the relation which exists between the dimensions of that part, and those of the *pelvis*. When that relation is in the natural order, the forceps, well directed, do no injury to the mother or child; but when that natural relation does not exist, and the head cannot pass through the *pelvis* without a considerable reduction of its size, both of them are more or less affected.

1113. It is commonly thought that the forceps cannot compress the head in one direction without forcing it to lengthen in another; and that these changes take place in a reciprocal proportion; that the capacity of the *cranium* suffers no diminution, and that the brain is but slightly affected by them. Such advantages would render the forceps much more recommendable still than they are; but these are very far from being their real effects. We cannot, by compressing the head in one direction, oblige it to lengthen in another; or if we do, it is so little, that it cannot balance what it loses in the first direction. If the forceps compress it four lines only,

the cavity of the *cranium* almost always diminishes in the same proportion, and the brain is exceedingly affected by it. To put these truths out of doubt, let us suppose the head locked and fixed lengthwise between the *pubes* and *sacrum* of the mother; a species of locking for which this instrument has been particularly recommended. From the manner in which most practitioners still apply the forceps, it should seem that they imagine the head is always in this position.

1114. If we then apply the forceps on the sides of the head, compressing it from one *parietal protuberance* to the other, we certainly shall not force it to lengthen from the *occiput* to the forehead, since those two parts are in very close contact with the *pelvis*. If the forceps, in this case, tend to force the *occiput* forward, and the forehead backward, it can only increase the force with which they are pressed against the *pubes* and *sacrum;* for the interior circle of that cavity remains always the same. Neither can the head, thus fixed, lengthen from the summit to the base, except a very little; the sinus of the instrument being much too narrow downward for that effect to be very remarkable, even if the disposition and solidity of the bones were more yielding: what it gains that way can by no means compensate what it loses in the direction in which it is compressed. If then the forceps, applied in this manner, diminish the transverse thickness of the *cranium*, it is only by depressing the *parietal* bones, by flattening them, and much more by making them ride one over the other at their superior edges: which cannot happen without contracting the cavity which contains the brain, compressing it, and more or less deranging its organization.

1115. We must not argue concerning the effects

of the forceps from those which we see the head sometimes suffer in passing naturally through a narrow *pelvis;* because there is scarcely any parallel between the two cases; the form of the mould, which such a *pelvis* presents to the head, being very different from that of the forceps, and the powers of art being never so gradual, nor so well combined as those of Nature.

1116. The head pushed forward for hours together by the natural agents of delivery, becomes insensibly softer and more pliable, and at length acquires the necessary disposition for moulding itself to the form of the *pelvis.* If it then flattens in one direction, it really lengthens in another; the form of the *cranium* only changes, and its cavity contracts so little, that the brain is scarcely affected by it. I have taken children whose heads seemed to have lost nine or ten lines of their natural thickness, in passing the superior *strait*, and seemed to have lengthened in the same proportion, without comprehending the tumor formed in the scalp, before the posterior *fontanelle.* The heads of several of these children were above six inches and an half, and even seven inches long, from the chin to the top of the aforesaid tumor; while the thickness from one *parietal protuberance* to the other was but two inches and an half, or two and three quarters in some, and three inches in others.* In a few hours after birth, the heads of these children spontaneously recovered the thickness which they had lost in de-

* *M. Solayres* informed us one day in his lectures, that he had taken a child the evening before, whose head, at the moment of birth, was eight inches long all but two lines, measured between the two points indicated above; while it had preserved but two inches five or six lines in thickness. The day after, this head had recovered the usual dimensions.

livery, and lost the length they had acquired by it. The head not only loses its form thus, in some cases, but sometimes even bends in the manner of a crescent, so that one of its sides shall be a little concave, and the other rounded, without at all affecting the child's life.

1117. But this good fortune is so far from attending all children who are obliged to traverse a *pelvis* of less than three inches in the small diameter, that the greater part of them perish before they are born. Among those which I have dissected, some had the bones of the *cranium* fractured, with depression; in others, those same bones were profoundly depressed without fractures; and in all, the *pericranium* and *dura mater* were detached from the *parietal* bones in the environs of the *sutures;* the substance which unites these bones was torn; which proves that they had rode considerably over each other; there were deep *engorgements* and extravasations in the *cranium*, as well as on several parts of its external surface. The fate of these children therefore will be different, according to the degree of solidity in the bones of the *cranium*, and of firmness in the *sutures*.

1118. The effects of the forceps always to be dreaded on the child's account, when there exists a disproportion between its head and the mother's *pelvis*, must be more or less so in proportion to these different states of the bones of the *cranium*. Those accoucheurs who imagine that we may with that instrument diminish the size of the head six lines and more, without danger, in all probability form their judgment from some observations similar to those I have just stated in par. 1115, and not from the effects of the forceps themselves. They estimate the degree of compression which the head suffers between the blades of the instrument, by the

degree of force which they apply to extract it; by the separation of the external extremities of the branches, and the degree of approximation which they undergo in the operation, or the space they pass through to come into contact. For one fortunate case, which they produce in support of their assertions, they perhaps pass over ten in silence, which, though unfortunate, might have instructed us equally. The following experiments may serve to throw some light on the degree of reduction which the head may undergo between the blades of the forceps.

1119. These experiments were repeated on nine children, who died immediately, or a few hours after their birth; and were of different sizes, though all at full time. To render them more conclusive, we took care to restore to the heads of these children the same suppleness which they had when alive, by plunging them into warm water, and moulding them with the hands; and we made use of the lengthened forceps mentioned in par. 1105. We provided three pair, all alike, of the best construction and temper. We applied them on the transverse thickness of the head, as I recommend them to be always applied; and afterwards according to its length, that is, one branch on the middle of the forehead, descending from the *fontanelle* to the root of the nose, and the other on the *occiput;* in order to know the reduction we could procure in those two directions, and how much the head would gain in one, while it lost in the other. Whatever distance there was between the extremities of the handles of the forceps, when the blades were applied to the sides of the head, we brought them close together, and fixed them in that state by means of a ribband, that the reduction of the head might not vary, while we measured its di-

mensions anew, in order to compare them with what they were before the experiment. It cannot be objected to us, that the heads of all these children might have been reduced still farther between the blades of the forceps, than we reduced them; since in each experiment we brought the handles of the instrument together till they touched at the extremities opposite to those same blades; and because the force which we used, sometimes with the hands alone, and sometimes with the ribband which served to fix and tie them together, was such, that those three select pair of forceps which we had provided, were all so bent and deformed, that they could not be used again, without being retouched by the maker. I shall now give the result of our experiments.

1120. The head of the first child, which was three inches and a quarter thick, from one *parietal protuberance* to the other, could not be compressed more than three lines in that direction; and was so far from lengthening from the forehead to the *occiput*, that it lost more than a line in that, though it was at liberty on a table; and three lines more, from the chin to the top of the posterior *fontanelle*. The *parietal* bones crossed each other superiorly a line and a half, and seemed to advance as much over the edges of the *frontis* and *occiput*. This same head, taken from the forehead to the *occiput*, was compressed to eight lines; and the handles of the forceps, then separated an inch and three quarters, could not be brought nearer than the distance of six lines notwithstanding all the force we could use. At that degree of compression the *sagittal suture* opened, the teguments burst in the middle of that *suture*, and a portion of the brain escaped.

1121. Another head, of the same thickness, could not be reduced more than two lines; and its length,

which was four inches, did not vary. Taken in the latter direction, we could not compress it more than three lines; and to accomplish that, we employed so much force, that the instrument lost four lines of its curves, that is to say, that the extremities of the blades were four lines farther distant, than they were before the experiment.

1122. A third head, of three inches two lines thick, could be reduced but two lines in that direction, and afterwards five in its length. These three heads acquired no increase in length, while they were compressed transversely; nor any additional breadth, whatever reduction was made from the forehead to the *occiput*.

1123. A fourth, of three inches four lines from one *parietal protuberance* to the other, but softer than the preceding, and having the *sutures* and *fontanelles* more lax, was compressed four lines, with more facility than the second and third had been compressed only two; and its length was increased half a line. Taken between the blades in the latter direction, it was reduced eight lines, but its thickness did not augment.

1124. The fifth head, as soft as the fourth, and having two lines less thickness, being compressed with the same degree of force, also lost four lines, and gained nothing in its length. Taken from the forehead to the *occiput*, it lost half an inch, without increasing its thickness.

1125. The sixth, which was only three inches thick, was reduced four lines and an half, and did not lengthen in any direction. Pressed from the forehead to the *occiput*, it lost eight lines, and its thickness was increased one line. In this degree of reduction, the region of the anterior *fontanelle* became very salient, and an opening of six lines made with

a history instantly discharged a portion of the brain as large as a hen's egg.

1126. A seventh head, three inches and a quarter thick, could not be compressed more than three lines: and an eighth, of three inches eight lines, could be reduced only three lines and an half.*

1127. We may conclude from these experiments, 1. That the reduction which the child's head suffers between the blades of the forceps, is different in some respects, according as the bones of the *cranium* have more or less solidity at the time of birth, and as the *sutures*, as well as the *fontanelles*, are more or less firm; 2. that that reduction can, in no case, be so great as accoucheurs have pretended, and that it will very rarely, and not without great difficulty, go beyond four or five lines when the instrument acts on the sides of the head; 3. that we ought never to estimate its extent by the separation of the handles of the instrument at their extremities, and the degree of approximation they are made to undergo before we extract the head, nor by the force we apply to bring them thus together: 4. and lastly, that the diameter, which crosses the direction in which we compress the head, far from augmenting in the same proportion as the other diminishes, does not usually increase a quarter of a line, and sometimes decreases.

1128. It will be objected, that a head more voluminous than those of the children I have just mentioned, which we took at random from among many others, would suffer a greater reduction than we pro-

* It may not perhaps be unimportant to observe that we took the dimensions of all these heads with a pair of callipers, before the experiment; and that we marked the points with ink, on which the branches of them were placed, that we might measure them again between those same points, when in the greatest degree of reduction.

cured in our experiments, if we employ force enough to bring the handles of the forceps, which are then farther separated, close together. The reduction certainly would be greater, if the head, at the same time that it were larger, were also softer; but by being greater, it would only become so much the more dangerous for the child; since it cannot take place in any circumstance, without diminishing the capacity of the *cranium* nearly in the same degree. If the head be larger than those which served for our experiments, it will generally, at the same time, be more solid, and much less susceptible of compression, unless the child be *hydrocephalic*. A head of four inches two lines from one *parietal protuberance* to the other (there are very few of that size at the time of birth), could not be reduced more than two lines; and the force requisite for that was so great, that the instrument was bent with it, and the blades were opened an inch at their extremities.

1129. The partisans of the forceps, and perhaps I am the most strenuous one living, may also plead that the bony circle formed by the distorted *pelvis*, through which we endeavour to bring the head engaged between the blades of the instrument, must act on those same blades, like the ring which is put on the handles of some pincers, and which, being advanced on them, closes their jaws, and more firmly fixes what they take hold of; since the forceps, thus disposed, form an ellipsis whose belly is above the said bony circle. The force of this argument cannot be denied; it is very certain that the resistance of the bony circle in question, would produce the same effect on the forceps, as the ring on the handles of the pincers, and would approximate the blades, if the diameter of the head, already compressed, should still surpass that of the *pelvis*, and if a sufficient force

be used to bring it through that canal. But as the pressure which the instrument then makes on the parts of the woman, interposed between the back of the blades and the bones of the *pelvis*, is equal to that which the child's head itself suffers, what disagreeable consequences may we not expect from it? Whenever the hand cannot conveniently reduce the diameter of the head by means of the forceps, in cases of disproportion, that instrument ceases to be recommendable.

1130. If it seems impossible to determine the degree of absolute compression which the head suffers between the blades of the instrument, from the space left between the extremities of the handles, and the approximation they are made to undergo, because the reduction is subordinate, as I have already stated, to the solidity of the bones of the *cranium*, to the state of the *sutures* and *fontanelles*, to the manner in which the instrument takes hold of the head, to the length of its branches, to their temper, &c. it is not less so to fix the degree beyond which the reduction cannot be carried, without affecting the child's life, which would be much more important to discover: for its effects, relatively to the latter, are also different, according to those same circumstances, and to many others which may arise from the duration of the efforts to which it has been exposed before the application of the instrument. This however appears certain, that a reduction of a given extent, when made naturally, is attended with much fewer bad consequences, than a similar reduction made with the forceps; because it is brought about by infinite gradations, and the latter must be made much quicker, notwithstanding the utmost possible slowness with which the accoucheur can act.

1131. Some practitioners are of opinion that the

reduction may be carried much farther than was done in our experiments; and affirm that it may go, not only six lines, but also to an inch, or an inch and a quarter, and that even at that degree it is not very dangerous to the child. Those practitioners are equally in an error on both these points: if there existed an instrument with which we could possibly reduce the diameter of the head an inch, it ought to be rejected as a murderous instrument. If the reduction of the head must be carried to that degree, to kill the child, we should never have a right to attribute its death to the forceps; for there are none which can reduce it so much. And supposing that there were, they could not be prescribed while the child is living; the intention of the art being as much to preserve the child, as to extract it from its mother's womb.

1132. In order to ascertain that the child's head has been reduced to such or such a degree, without killing it, the diameter on which the forceps have been applied should have been measured before it was compressed; and should be measured again after the exit of the head, in the state of reduction in which it was between the blades of the instrument: which no one has done, or ever will do. The graduated scale which some have recommended to be adapted to the handles of the forceps with that view, could only serve to demonstrate the degree of separation and approximation of them, and not the reduction of the head. Therefore we ought to place no confidence in all that has been published on this point; because we have only general *data*, and those very uncertain.

1133. By comparing the degree of separation at the extremities of the handles of the forceps, in all our experiments, with what I have observed in the

course of my practice, whenever I have placed the instrument on the sides of the head; and the degree of force used in both cases, to approximate the handles and bring them into contact, I can affirm, that the reduction may go from two to four lines without affecting the child's life: but it is not easy to determine how much farther it can be carried, without causing its death.

1134. These reflections will appear of the utmost importance to those who have declared openly against the use of the forceps, and think it their duty to proscribe them, under the vain pretence of defending the cause of humanity: for, according to their principles, the forceps necessarily adding the thickness of their two blades, which is three lines, to the thickness of the head, we must have a reduction of three lines to compensate that addition. Therefore that reduction, which we cannot look upon as exempt from every kind of inconvenience, seems to them of no use in delivery, since the thickness of the head with that of the instrument, remains the same relatively to the diameter of the *pelvis*. This reasoning would be unanswerable, if we could compress the head but three lines, if the greatest thickness of the blades answered exactly to the parietal protuberances, if those protuberances did not let themselves into the open part of the blades, so far as to be often level with their external surface, and if the belly of the ellipsis formed by the instrument thus charged with the head, exactly corresponded with the small diameter of the *pelvis*. But things go on in a very different manner from what the detractors of the forceps have stated, especially with respect to some of these points, when they are directed by a skilful hand.

1135. If the forceps, conducted in the best and

most methodical manner, are not without inconvenience to the child, when there is a disproportion between its head and the mother's *pelvis*, with much more reason is it so, when that instrument is in the hands of those who, forgetting the axiom, *sat citò si sat bene*, imagine that their honour and their success depend on the celerity with which they operate: for instead of one victim, they often destroy two; the forceps, directed upon such principles, being not less dangerous to the mother than the child.

1136. The advantages of the forceps are never more evident than in those cases where it is only required to assist or supply the strength of the mother; as well as when we are led to use them only on account of certain accidents, which sometimes complicate the labour, such as an hæmorrhage, &c. But we are not always so fortunate as to have to use them only in such circumstances; and notwithstanding the danger which seems attached to their use in other cases, we are often obliged to have recourse to them to avoid operations whose success would be still more doubtful.

1137. When the small diameter of the mother's *pelvis* is some lines less than three inches, we must not expect to bring the child alive, by means of the forceps; and their use is even dangerous when it is but three inches. Considering that instrument only as a resource for terminating the delivery, and abstracting the fatal effects it may have on the child's life, and the parts of the mother; yet its use ought to be limited: for its application is by no means safe, when the *pelvis* is so defective as not to leave an opening of two inches six or eight lines. For in whatever manner we then apply it, we ought to reckon much less on the reduction it will procure, than on the advantage to be derived from it, as a

means of pulling at the child's head, and by that means seconding the expulsive efforts of the mother.

1138. Most authors have not used the forceps till the child's head was descended into the cavity of the *pelvis*, or at least engaged a third, or half its length. *Smellie* seems to have been the first who departed from that rule, and who employed them while the head was still above the superior *strait*. It was particularly with that view that he constructed his second forceps longer than those he used at first, and added a new curve to them, similar to that of *Levret's forceps*. *Smellie* not only knew the possibility of carrying them so far, but also that it was easier to apply them there, than when the head is engaged transversely in the superior *strait*, and its sides strongly wedged between the *pubes* and *sacrum;* since in that case he recommends to push it up entirely above the brim of the *pelvis*, in order to conduct the blades of the instrument on the child's ears more easily.

1139. *Smellie* knew how at the same time to estimate the advantages and inconveniences of taking hold of the head above the *pelvis*, with his new forceps. Having observed that the latter were often greater than the former, he resolved not to advise it publicly, and not to demonstrate, even to his disciples, all the benefit that might be derived from it, for fear, said he, of rendering them too enterprising.

1140. He among us who honours *Roederer* with being the author of the idea of taking hold of a head free above the brim of the *pelvis*, with the curved forceps, doubtless had not read the works of *Smellie*, which are anterior to what that author has transmitted us on the art of Midwifery: he might there have seen, not only what I have just related, but moreover, that a Mr. *Puddicombe*, as far back as the year 1743, had successfully delivered a child

with the forceps, whose head was still above the superior *strait*. Besides, the fact related by *Roederer* cannot be attributed to him:* we see clearly in the observation itself, that he is only the editor of it.

1141. If Mr. *de Leurie* is the first French accoucheur who has carried the forceps so far, as he declares,† he is not the first who recommended it among us; for he says nothing about it in the edition of his work of 1770; and the late M. *Solayres* ‡ who recommended it in his private lectures from the year 1769, put it in practice himself, in presence of several of his pupils, in 1770. I have used the forceps myself at least twenty times since, in similar circumstances; but not always with the same success for the child, nor could it be, because, in some cases, I had not recourse to them till after its death. It seems also that M. *Coutouly*, who likewise attended the lectures of *Solayres*, practised it on the same authority.

1142. The utility of the forceps is not limited to those cases only, in which the crown of the head presents at the orifice of the *uterus:* we employ them also in other circumstances; as when the child's face engages first, when the head is retained after the exit of the body, as we sometimes see it in labours where the child is extracted by the feet. It is also in the works of *Smellie* that we find the first traces of the use of the forceps in the latter case; and that author is so much esteemed among us, that I am inclined to think it was from

* Opuscula Medica Gottingæ, 1763, pag. 206, obs. 1.

† I know not in what year he applied the forceps on the head at the superior *strait* for the first time.

‡ M. Solayres professed midwifery at Paris from 1769 to 1771 inclusively.

forgetfulness, and not with a design to detract from his merit, that one of our countrymen has published that *Smellie* only hinted the use of the forceps in that case, and had not described the manner of applying them.* I shall, in the sequel, detail the cases in which we ought to employ the forceps, and the method of using them in each.

* M. de Leurie.

PART IV.

Of the Causes which make the Use of Instruments necessary in the Practice of Midwifery, particularly the Forceps and Lever.

1143. AMONG the causes which ought to determine us to deliver with instruments, some leave us no resource but in their assistance; and others only indicate their use in preference to other means, the effect of which would not be so prompt nor so salutary.

1144. Of this last class, are, an *uterine* hæmorrhage, convulsions of the mother, frequent *syncopes*, exhaustment, the cessation of the pains; diseases which permit not the woman to yield to the efforts necessary for the expulsion of the child, such as certain *hernias*, an habitual spitting of blood, the descent of the *uterus* and an inversion of the *vagina:* lastly, the premature issue of the umbilical cord, and often the presence of a second child, which by its position considerably retards, or hinders the delivery of the first.

1145. According as these causes manifest themselves sooner or later in the course of labour, they indicate the use of this or that means preferably to others. When they attack with violence at the beginning of labour, and continue with the same force, leaving no resource but in the extrac-

tion of the child, the head being still above the *pelvis*, we ought to turn it and bring it by the feet. We should however be free to choose between that method and the application of the forceps, though more difficult, if we thought the success more certain than that of turning, which in this case generally requires more knowledge and dexterity. This option between the two methods would be still more allowable, if the head were engaged half its length, or more, if they both promised the same advantages; but in my opinion the forceps merit the preference. That instrument is indicated exclusively when one or more of the above mentioned causes do not occur till the head arrives at the bottom of the *pelvis*. And no other can enter into a competition with it, when the head has not only cleared the superior *strait*, but also the neck of the *uterus*, so as entirely to fill the *vagina*,* except it be the crotchet when we are certain of the child's death;† because we cannot then turn it and bring it by the feet.

1146. Certain disadvantageous positions of the head, which we cannot rectify with the hand alone, its being locked, an extreme defect of size in the *pelvis* of the woman, and sometimes the monstrous conformation of the child; certain morbific affections, whether of the child, or of the soft parts of the mother concerned in delivery; *extra-uterine* conceptions, and the rupture of the *uterus*, are in general causes which indispensably prescribe the use of instruments.

1147. The greater part of these causes having

* See par. 958, and following.

† See the article which treats of the signs of the child's death.

been already treated of in so many particular sections,* and as the others cannot be explained more seasonably, than when I lay down the method of operating in each of them, I shall confine myself here to the locked head, and the distinction to be made between that state, and that where the head is only stopped in the passage.

Of the Locked Head.

1148. Locking is that state in which the child's head, more or less advanced in the *pelvis*, is so wedged between the bones, that it cannot be pushed farther, or even moved in any other direction, by the efforts of Nature alone.

1149. The greater part of those who have spoken of the locked head have had this idea of it; but some have added that it was equally impossible to push back the head with the hand alone above the point to which it was advanced: which however I cannot admit. "For the head to be really locked," says M. *Levret*, "it is absolutely necessary that it should "be more or less advanced, without a possibility of "being forced farther down by the efforts of Nature "alone, or of being pushed back with the hand; for "if one or the other be possible, it is not perma-"nently stopped, it is not really locked." After such a definition,† one would not expect to find some of those who admit it, so often contradicting themselves, by employing the words locked head indiscriminately to signify the state in question and that

* See from par. 786, to par. 826 inclusively.

† Suite des Observations sur la Cause de plusieurs Accouchemens Laborieux, part. ii. p. 266.

in which the head is merely stopped in the passage, though they differ from each other in many respects. See the following article, par. 1184.

1150. Some authors have distinguished two general species of locking, relative to the manner in which they imagined the head might be fixed. In one, say they, the head touches forcibly at two parts of its surface diametrically opposite, whether against the *pubes* and *sacrum*, or against the lateral parts of the *pelvis;* and in the other it is equally jambed on every side. We may reasonably deny this last species; for, by the confession even of those who admit it, it cannot exist. "There is no example," says M. *Levret*, "of a locked head on which we cannot "apply the forceps with more or less difficulty, either "at one part, or another, because it is not equally in "contact with the *pelvis* every where."* The opinion of *Roederer* on this subject is however very different. "In the complete *paragomphosis*," says he, "the child's head is so jambed on all sides in the "*pelvis*, that we should not be able to pass the "smallest needle between them, in whatever part "we might attempt it."†

1151. I admit but one general species of locking; that in which the head is fixed only by two points of its surface diametrically opposite. But this species contains particular ones; for the head is not always situated in the same manner, nor fixed by the same points: sometimes it is jambed with its greatest length between the *pubes* and *sacrum*, and sometimes with its thickness only. In the first case it is the forehead and the *occiput* which are in contact with the interior circle of the *pelvis;* in the se-

* Elemens sur l'Art des Accouchemens, edit. iii. Aph. 617.

† Roederer, § 431.

cond, the *parietal protuberances*. This latter species is much more rare than the former, and cannot happen but in a *pelvis* so narrow as to have but three inches and a few lines in its smallest diameter, unless the head be excessively large.

1152. The differences in the locked head, according to many authors, depend not only on the extent of the points of contact which fix it, but also on the region which the head presents to the touch, and on the manner in which that region is placed with respect to the *pelvis*. Sometimes, say they, the crown of the head advances first, and at other times the *occiput*, or one of the temporal regions, or even the face. It is not very easy to conceive how the head can be locked in these latter cases, especially according to the definition which those same accoucheurs have given of locking. The head may advance more or less when it presents the face, the *occiput* or one of its sides, and then it generally stops in the passage; but it is never really locked unless the *vertex*, or crown of the head, advance first. The proof of this truth is evidently discovered in the observations of those who have treated of the locked head. We there discover that for one head really locked, which they have met with, they have charged ten with being so, although they were very movable in the *pelvis*, even when the *vertex* presented.

1153. The sentiment of M. *Levret* on the mechanism of locking, and the circumstance in which that accident most frequently happens, does not appear to me to be conformable to those extensive views which he displays elsewhere on this subject. "If," says he, "the waters drain off suddenly, "either totally, or in part, in the first period of "labour, and the *bregma* of the child should be op-

"posite the middle of the projection which results "from the union of the body of the last *lumbar* "*vertebra* and the *sacrum*, that projection may "lodge in the *bregma*, by depressing it at each "contraction of the *uterus;* which will hinder the "head from turning in the second period, for the "forehead to place itself on one side; it will fix it- "self in that part, and then the *occiput* will first "tend downwards as far as the neck: it will lodge "behind the arch of the *pubes*, and the shoulders "will rest on the superior branches of the *ossa* "*pubis*, hanging over them more or less; and if the "head remain long in that state, it will be locked."* How is it possible the head should be locked in this case? It cannot follow a more favourable course in its descent; it is its posterior extremity which first advances in the cavity of the *pelvis;* where it is scarcely arrived before the back of the neck is found against the *symphysis* of the *pubes*, and the occipital region answers to the arch of those same bones, under which it must engage, to rise up before the *mons veneris* turning round on the inferior edge of the *symphysis*, as on its axis; it is this position which the head generally takes with respect to the inferior *strait*, whether it has traversed the superior in a diagonal position, or any other: this is the best possible position, considered in the latter period of labour, and that which we ought to place the head in, when the efforts of Nature do not direct it so. See what I have already said on the mechanism of the different species of natural labour.

1154. If the head in the case described above,

* Observation sur les Accouchemens Laborieux, part. ii. edit. 4me. page 277.

sometimes stops and remains in the lower part of the *pelvis*, after having followed the course indicated by M. *Levret*, whether it be retained there by the situation of the shoulders over the *ossa pubis*, or by any other cause, it cannot be locked there. To be really locked, the head must follow a very different course at the beginning of labour; for it cannot be fixed with its greatest length between the *sacrum* and *pubes*, unless the *occiput* rest behind the latter superiorly, and remain there in some measure immovable, while the forehead is forced to descend posteriorly opposite the *sacro-vertebral* angle. By following this course, it is the largest diameter of the head which tends to advance foremost; it is the anterior *fontanelle* which presents more and more, in proportion as the head advances; it is on this *fontanelle* that the *teguments* swell and puff up; and it is this same point which consitutes the summit of the conical figure acquired by the head when locked in the *pelvis*, instead of being sunk and depressed by the projection of the *sacrum*, as asserted by M. *Levret*.

1155. The head may also be locked or jambed lengthwise between the *pubes* and *sacrum*, if the *occiput* resting against the latter ceases to advance, while the forehead shall be obliged to descend behind the former. In either case, it is the large diameter of the head which tends to pass horizontally between those two bones: which cannot happen without causing considerable frictions, even when the *pelvis* wants but a few lines of its natural size in that direction. I delivered a woman in whom the child's head had been locked in that manner for two days, although the *pelvis* was of the usual size. Five children, each more voluminous than that, had already passed it without difficulty; because

their heads had presented differently, and the *uterine* forces were then differently directed. I have since that time met with the same case in two other women; I was obliged to deliver them also, after a very long labour. Whenever the child's head follows the course stated by M. *Levret*, far from offering its greatest diameter foremost between the *pubes* and *sacrum*, it only places its height there, considered from the base of the *cranium* to its summit, or its perpendicular diameter, which is generally fifteen or eighteen lines less than the former.

1156. The child's head when locked, always acquires the form of a wedge more or less lengthened, whose base remains above the part where it stops; as *de la Motte* has very clearly expressed it, by comparing it then, with respect to the *pelvis*, to the keystone of an arch: whence we see that it cannot be locked but by passing from a larger space into a narrower, and that it is not impossible to push it back above the point where it is stopped and fixed.

Of the Causes, Signs, and Accidents of the Locked Head.

1157. The head cannot be locked without the concurrence of several causes, of which some are predisposing, and others determining or efficient. The latter depend on the action of the *uterus*, and the other powers which contribute to the expulsion of the *fœtus:* but that action must be vehement, and continue a long time: we need never fear it in a delicate and exhausted woman, whatever causes exist which might otherwise occasion it.

1158. The causes which we call predisposing

arise from both mother and child, and generally consist in a defect of proportion between the dimensions of the *pelvis* and of the head which must pass it. This defect of proportion sometimes depends only on the bad position of the head; at other times on its extraordinary size and solidity, or on the deformity of the *pelvis*. It is so difficult to discover and estimate by the touch, not only the degree of disproportion which may cause the head to be locked, but also the necessary degree of solidity in the head, and the quantity of force which the woman must exert for it, that we cannot absolutely judge at the beginning of labour, without fear of mistaking, whether the head will be locked, or whether it will only meet with more or less difficulty in traversing the *pelvis*. One thing we are very sure of, that the head can never be locked in a *pelvis* very small or very large, relative to its own volume; and that that accident is no more to be dreaded when it is very supple, and the woman very weak. It may stop in the latter case, but never be really locked.

1159. The immobility of the head is the essential mark and pathognomonic sign of its being locked. The tumefaction of the hairy scalp, that of the neck of the *uterus*, which then forms a kind of pad more or less thick under the head, the *engorgement* of the *parietes* of the *vagina* and the external parts of the woman, are but accessory effects, though inseparable from it.

1160. These effects always precede the head's being locked, and augment during its continuance. It is only to be dreaded when those symptoms manifest themselves; but it does not always happen when they are present. We frequently observe those symptoms, but the head is very seldom really locked.

1161. It is not necessary that the head should ad-

vance between the bones of the *pelvis*, and be strongly jambed there for the *tegaments* of the *cranium*, the neck of the *uterus*, the *vagina*, and the external parts of the woman to be *engorged* and inflamed; it is sufficient that it be strongly pressed on the entrance of that cavity, to occasion all those effects; since we see them appear, in the same order, when there exists, as I may say, no proportion between the diameters of the superior *strait*, deformed in the highest degree, and those of the head; so that it cannot any way engage in it. *De la Motte* and *Roederer* inform us, that in this last case, the hairy scalp sometimes swells and projects so far into the *vagina*, that it might lead us into an error, by making us believe that the *cranium* itself was advancing, while it remains entirely above the *pelvis;* which I have observed as well as they. I have moreover seen gangrenous eschars in the neck of the bladder after these same cases: when the woman has not been assisted in time with respect to the delivery.

1162. Of all the signs which indicate the head's being locked, there is none less certain than the swelling of the *tegaments* of the *cranium* and the tumefaction of the parts of the woman. If it sometimes depends on the pressure which it suffers between the bones of the *pelvis*, it much oftener is caused only by the rigidity or hardness which continues after the opening of the membranes, in the pad which constitutes the neck of the *uterus*. It is indeed easy to judge from which of these two causes it proceeds. In the first case, the swelling extends higher than the edge of the orifice of the *uterus*, as far as the part where the bony case is pressed against the surface of the *pelvis;* and the orifice itself is also tumefied, and more or less painful: in the second, the pad formed by the neck of the *uterus* is hard,

not very thick, and the swelling of the *teguments* of the *cranium* is limited to the same height. Much oftener still, the tumefaction in question depends only on the resistance which the external parts oppose to the passage of the head, as we almost always remark in a first labour. As to the tumefaction of those parts themselves, of the *vagina* and neck of the *uterus*, how many times has it not been occasioned by frequent and inconsiderate touching, either of an accoucheur or midwife? Lastly, this tumefaction may be anterior to labour, and depend only on pregnancy, or even on other causes which are foreign to it.

1163. Not only, these symptoms do not certainly characterize the locked head, since some of them may be foreign to labour and pregnancy; but we should not always be founded in supposing a head to be locked which has ceased to advance after descending to the bottom of the *pelvis*, though pushed forward by violent efforts; and even when it seems impossible to push it back: for though it cannot then descend farther, nor recede in a sensible manner, it is often movable on its pivot, and may turn round as on its axis; which proves that it is not locked but only stopped in the passage. See par. 1185, and following. I could quote a great number of facts in support of all these assertions; and in many of them the finger methodically placed, and a different position on the part of the woman, have happily terminated labours, that could not have been finished with the forceps.

1164. The head is not really locked but when it cannot make any of these movements: when no instrument whatever can pass over more than about a quarter of its circumference, any more than that of the inside of the *pelvis*, nor penetrate the places where those parts are in contact.

1165. It would be very advantageous if we could distinguish the cases in which the child's head must be locked, from those in which it is only threatened, that is to say, in which the head cannot, without a great deal of difficulty, traverse the canal presented it by the *pelvis;* that we might in the latter case abandon the delivery to Nature, and in the other, deliver before the accident takes place. But it is almost always impossible to make that distinction, because the same symptoms which precede the locking, equally manifest themselves when the head only threatens to become so.

1166. In either case, the head not being able to engage but by the crossing of the bones, or riding over each other's edges, the *teguments* of the *cranium* form into folds in the direction of the *sutures;* those same *teguments* swell, and produce a tumour larger or smaller, indued with a sort of elasticity which never deceives the finger of an accoucheur. The head having engaged with extreme difficulty, sooner or later stops; or else it advances at last so rapidly, that it makes more progress in fifteen minutes, and often in one, than it had done before in fifteen hours or longer.

1167. This difference arises from the form of the *pelvis.* When the head stops in the middle of its course, and becomes locked, the *pelvis* is not only narrow at its entrance, but also in the middle. This last, which is called the excavation, is on the contrary larger than common, or at least as large, as well as the inferior *strait*, when the head descends rapidly at the latter end of labour. In the former case, the head suffers a more considerable friction as it advances farther, till it be entirely fixed: which increases the force and intensity of the symptoms stated above. In the latter case, it undergoes those

frictions only in its passage through the superior *strait*, and its greatest breadth has no sooner cleared that, than all the above mentioned effects disappear; as it then finds itself in a larger space, and is no longer compressed, because the bones of the *cranium* recover their former state, and the circulation intercepted in some of the veins of the *tegument* and of the *aponeurotic* covering of the head is restored.

1168. We should then be obliged to leave almost entirely to time to distinguish the head which will be locked, from that which, after threatening it, shall be delivered without help, if we could not, in all these cases, judge of the form of the *pelvis*, of the solidity of the bones of the *cranium*, and the firmness of their *sutures*; as well as the strength of the woman. If there are cases where we can have no other rule but time, we ought to know how to estimate that time, that we may be able to decide seasonably what measures are to be pursued; the salvation of both mother and child often depends on an instant, and the accoucheur is in some measure the arbiter of their fate: too much confidence in the unknown resources of Nature, or in the effect of certain remedies, may be as pernicious to both, as too precipitate and ill directed *manœuvres*.

1169. The locking of the head is always very pernicious to both mother and child: it cannot exist long without destroying the latter, and exposing the former to a thousand accidents, which often leave a dreadful train of evils behind, render her life a burden, and make her every moment wish for death.

1170. Depression, and often fractures of the bones of the *cranium*, deep *engorgements*, extravasations in the ventricles of the brain, under the *dura mater*, between that and the bones, under the *pericranium* itself detached from the *parietalia*, &c. as well as profound

ecchymoses between the *sub-occipital* muscles, are effects which I have observed in many children after their heads had been locked.

1171. The head cannot be locked without strongly compressing, and in some measure destroying the soft parts of the woman in the places where it is in contact with the interior circle of the *pelvis;* and causing a swelling and inflammation of the parts situated underneath, such as the neck of the bladder, the *urethra*, the edge of the orifice of the *uterus*, the membranes of the *vagina*, the *rectum*, and even the external parts. The urine ceases to flow, and we cannot draw it off with the *catheter*, because the canal of the *urethra* is totally obliterated. The woman tormented at the same time by the necessity of discharging it, and by the pains of labour which perhaps she is solicited to make the most of, gives herself up to inconsiderate efforts, till she is exhausted, or her pains go off. A fever comes on, the blood is heated, and carried impetuously towards the superior parts, where it often produces new disorders, the effects of which are more dreadful than those of the first.

1172. If the inflammation of the parts which cover the inside of the *pelvis*, sometimes subsides after delivery, when the head has been locked, sometimes also, and doubtless too often, a gangrene is the consequence. The falling off of the *eschars* leaves broad and rebellious ulcers, as well as openings into the neck of the bladder and the *rectum;* and to complete the misfortune, when the woman survives, the urine and *fæces* fall continually into the *vagina*, cover the surface of those ulcers, increase their putrefaction, and would render them incurable, if they were not so in their own nature.

Indications in the Locked Head, considered exclusively of the Accidents which are the consequence of it.

1173. According to the sketch I have just given of the consequences of the head being locked, we see how salutary it would be to prevent it, by terminating the delivery seasonably. If we cannot always procure this good fortune to the mother and child, at least we ought to operate without delay, when we discover that it has taken place; unless particular circumstances which are already consequences of it present more pressing indications, and require us to use means which then become preparatory to delivery; such as bleeding, baths, emollient topics, &c. though it is to be feared they would be employed without effect, since they cannot reach the first cause of all those accidents, which is the locking itself.

1174. The extraction of the child is the principal indication; but the method of performing it must be varied according to the state of the child, as well as of the parts of the mother.

1175. The ancients used crotchets to open the head and extract it; and some as late as the middle of the present century, only used them after they had opened the head more methodically with other instruments, and emptied it. Several, among the moderns, have proposed fillets variously arranged, which have been very happily forgotten since the invention and improvement of the forceps. If the former thought themselves reduced to the deplorable necessity of mutilating the child, the latter directed all their endeavours to preserve it.

1176. *Mauriceau*, whose work is still much es-

teemed, thought it was a necessary cruelty to kill the child when the head was locked, in order to save the mother, whose death appeared to him not less inevitable if that method were not taken; and *de la Mothe*, more timid, waited till it was deprived of life to open the head and extract it with the crotchets. The conduct of the latter would not at present inspire less horror than that of the former: such practices could not be tolerated, but in the times in which their authors lived; the art had not then counted *Smellie* and *Levret* among its masters, and many others, who have since enriched it with their discoveries.

1177. If the forceps in this disagreeable circumstance do not always secure the life of the child, already languishing more or less, at the time we use them, it must at least be confessed that a great number have been indebted to them for their existence, who would otherwise have been sacrificed for the safety of their mothers. Though this instrument adds little to the accidents the woman then suffers, if we use it with method and judgment, it adds enough nevertheless to justify us upon some occasions, in preferring the crotchets and other instruments destined to open the head, if we could have certain signs of the child's death.

1178. *Roonhuisen's* lever, published and so much boasted of towards the middle of this century, has all the inconveniences of the forceps, without any of their advantages, though some accoucheurs still give it the preference. It would be the most proper instrument, if it could be insinuated into the very parts where the points of contact are, which essentially constitute the locked head, if the greatest thickness of the head were engaged as far as those points, and if that head had only to pass out of a narrower place into a larger. The lever would be the

most proper instrument to make it execute that first step; but we ought to expect nothing more from it. Its utility would be limited to that; and all that has been attributed to it beyond is illusive.

1179. The Cesarean operation, recommended by *Roederer*, in what he calls a *paragomphosis*, in which, says he, the head is wedged on all sides against the internal edge of the *pelvis*, and makes but one body with it, though it would endanger the mother's life, would not certainly save that of the child; the locked head however never is such as that author has described it. The advantages of the Cesarean operation, if any could be then allowed it, would be much inferior to the section of the *pubes*. The circumstance in question is precisely that in which that new operation would have the most success, if the *ossa pubis* could be separated with as little inconvenience as its partisans have asserted; for the separation of those bones. by destroying one of the points of contact which keep the head fixed, would certainly favour its exit.

1180. Whenever there are any hopes of extracting the locked head with the forceps, we ought to have recourse to them: the cases, if any exist, in which they are insufficient, must be excessively rare. No other method can enter into competition with that while the child is living; but when we are certain of the child's death, if the parts of the mother are in a state of inflammation and pain, it is better to open the *cranium* and empty it, in order to bring away the head with the crotchets, than to use the forceps: this method has the advantage of destroying the force of the points of contact which constitute the locking; whereas the forceps, in many cases, augment it: which may give birth to new accidents, or aggravate those which exist already.

1181. Before we enter into the detail of all these

operations, and of the instruments to be made use of, it is necessary to show wherein the locked head differs from the head merely stopped in the passage.

Circumstances in which the Head may stop in the Passage without being locked, and the difference between those two States.

1182. Authors have used the word passage so vaguely, and in such different circumstances, that it is not very easy to decide what they meant to express by that term. Have they given that name to the whole extent of the canal which the head must pass; or only to the inferior *strait* and the opening of the soft external parts, as seems to appear through the obscurity of the writings of most of them? To determine the ideas of the reader on this subject, I advertise him here, that by the word passage considered with respect to the *pelvis* alone, I only mean the inferior *strait;* and I acknowledge no head stopped in the passage, but that which cannot pass it, notwithstanding the most powerful efforts of Nature.

1183. Divers causes may stop the head at that place, and every one of them presents different indications. The head may stop in the passage, 1. whenever it preserves the transverse or diagonal position, in which it cleared the superior *strait;* 2. when the chin recedes from the top of the breast, and the *occiput* turns backward from the time it begins to advance; because it then comes with the upper part of the forehead to the centre of the inferior *strait*, and presents the whole length of its longest diameter to it, as observed in par. 949, and following; 3. it may find the same obstacle to its exit, whatever may be

its position, when the inferior *strait* is contracted; 4. when the external parts make much resistance; 5. lastly, if the shoulders themselves stop at the superior *strait*. According to the opinion of many accoucheurs, the shortness of the umbilical cord, and its being twisted round the neck of the child when it is very long, may also retain the head in the passage, and hinder it from passing: I think I have sufficiently exposed that error in another place, and therefore shall not discuss it again. See par. 459, 819, and following.

1184. The head which is merely stopped in the passage differs from that which is really locked, in not being absolutely immovable as that is. In general, we might push it back with a view of searching for the child's feet, if we had no other resources for terminating the delivery: excepting, however, when it has cleared the neck of the *uterus*, or when it has not passed the superior *strait*, more or less contracted, without extreme difficulty. Though the head in this last case cannot go back, yet it enjoys a rotatory motion, however limited it may be, which it cannot execute when locked.

1185. If the head is not immovable in this case, as in that where it is really locked; if it advances a little during the pain, and afterwards goes back; if we can easily push it back even above the margin of the *pelvis*, or make it turn on its axis, there is nevertheless a circumstance in which its movements are so limited, as to give reason to suppose it really locked. To explain this circumstance, we must suppose the *straits* of the *pelvis* of a certain given size, under the natural dimensions of the head, while the excavation is respectively larger: which often happens when the *sacrum* is deformed by too great a curve. I shall fix the distance at three inches and a

few lines from the *pubes* to the *sacrum* superiorly, and to the bottom of the first piece of the *coccyx* inferiorly.

1186. Proceeding on this supposition, which is not begged, since we find many *pelves* similar to that supposed, the head, the transverse thickness of which is commonly three inches and a half, taken between the *parietal protuberances*, cannot clear the superior *strait*, but by diminishing several lines in that direction; nor the inferior *strait*, but by suffering an equal reduction from its summit to the base of the *cranium*, since it is that dimension which must then pass in the direction of the small diameter of that *strait*.

1187. The progress of the head in this case is at first very slow, folds are formed in the *tegiments* which cover it, and we presently perceive a tumefaction more or less extended, which continues to augment till it has cleared the superior *strait;* as we observe when it is going to be locked. But no sooner has it passed that *strait*, than all the above mentioned effects vanish, if the pains go off, or abate; and the head recovers its original thickness, as happens before our eyes when the child comes into the world with the *cranium* lengthened, and as it were deformed: because it is then at liberty in the excavation of the *pelvis*, and is no longer compressed at the sides, as at first. This restitution of the transverse thickness of the head takes place so much the more speedily, in this case, because the pressure which the *vertex* suffers on the point of the *sacrum*, the *coccyx* and *perinæum*, tends to diminish its height, to curve the *parietal* bones, throw their *protuberances* outwards, and lastly, augment the breadth of the *cranium* in that direction.

1188. Unless the efforts of the woman continue

yet a long time, and with vehemence, the head thus retained cannot be expelled from the *pelvis;* so difficult it is for it to lessen sufficiently from the summit to its base. If those efforts continue, the tumefaction of the hairy scalp, far from diminishing, as I have said above, augments more and more, as we see when the head is really locked; and if it then differs in any thing from the locked head, it is that it can still descend a little during each pain and go back again immediately, that it can be moved a little on its axis, and touches no where with so much force, but that we may introduce a proper instrument between it and the *parietes* of the *pelvis*.

1189. The *cranium* is then as it were, shut up in the middle of that cavity, without being able to advance or recede sensibly; for whether we attempt to extract the head or push it back, we must diminish its size in the diameter which is to pass between the *pubes* and *sacrum*. It must be flattened from the *vertex* to the base, to come out; and from one *parietal protuberance* to the other, to go back again above the *pelvis*, as it was when it came down; which cannot be brought about with the hand alone, and besides would be attended with much danger.

1190. I have already stated that every cause capable of stopping the head in the passage presents a different indication; this is the time to demonstrate that truth. When the obstacle which prevents the head from engaging in the inferior *strait* only arises from its transverse position with respect to that *strait*, it must be changed, and the *occiput* brought under the *pubes;* unless reasons already known direct us to turn it towards the *sacrum*. When the head engages in such a manner that the

superior part of the forehead presents at the centre of the inferior *strait*, we must push back this part to bring down that where the *sagittal suture* joins the *lambdoidal*, as we see in par. 958, and following. We must extract the head with the forceps whenever it is stopped in the passage by a defect in the dimensions of the inferior *strait*, except that defect be excessive; for then it will require other methods.* While on the contrary, it will suffice, to relax and mollify the external soft parts, when they oppose a resistance superior to the action of the organs which endeavour to expel the child, and when the head is stopped by no other cause. We cannot so easily change the direction of the shoulders, at the superior *strait*, when it is they which oppose the effect of that same expulsive action, though M. *Levret* has recommended it;† and I foresee the astonishment which the proposition of the forceps in this case would cause in the minds of those who have not sufficiently considered it.

1191. It is only by inference that we can ever judge that it is the shoulders resting on the superior *strait* which obstruct the expulsion of the head. For that inference to be well founded, it is necessary, 1. that the *pelvis* be of the usual depth, moderately contracted at its entrance, but its other parts well form-

* Crotchets if the child be dead; and the Cesarean operation if living. We must not here confound the case where the extreme narrowness of the inferior *strait* obstructs the exit of the head and the application of the forceps, with those mentioned in par. 1185 and following, and which have given occasion to the note on par. 1179, because it is very different from them. When the inferior *strait* is so much contracted, the superior is very wide, and the head may easily be pushed back.

† M. *Levret*, Suite des Observations sur la Cause & des Accidens de plusieurs Accouchemens Laborieux, 4me. edit. page 4, Observ. ii.

ed, that is to say, of a good breadth at the inferior *strait;* 2. that the head when in the excavation should be free and not wedged; 3. That the external parts should not appear to hinder its exit, and, that the expulsive forces of the woman continue in action long enough to expel it in any other case. If we are well founded then in attributing the obstacle to the situation of the shoulders, and their relation to the superior *strait*, yet it is not till after the exit of the head that we can be certain it depended on no other cause.

1192. This case differs in many respects from that for which M. *Levret* recommended changing the direction of the shoulders at the superior *strait*. either by advancing a hand into the *vagina*, or by using one of the blades of the *forceps*.* I think I have demonstrated that the obstacle which then opposed the expulsion of the head, arose from its position only and from the manner in which it had engaged; and that it no way depended on that of the shoulders.† In the case in question, on the contrary, it depends on that entirely: resting on the margin of the *pelvis* and hanging over it, they spread still farther during the effort which tends to push the *trunk* downward, the shoulders hinder that same effort from acting on the head and expelling it. It would be equally in vain, says the celebrated author I have just quoted, to endeavour to extract it, since the shoulders could not follow.‡ If we attend to the mobility of the child's neck, and at the same time compare its length with the depth of the *pelvis*, we shall see

* The head has not turned on the back of the neck as it advanced, as remarked in par. 958 and following; It is the posterior *fontanelle* which presents here at the bottom of the *pelvis*, and not the top of the forehead.

† See par. 950 and following.

‡ *Levret*, in the part already quoted in par. 1190.

that the opinion of M. *Levret* is not so well founded as it appears at first sight, and that we may extract the head though the shoulders should not engage a single line. To place this truth in a clear light, let us suppose the child's head at the bottom of the *pelvis*, the *occiput* behind the left *foramen ovale*, and the posterior *fontanelle* near the edge of the arch of the *pubes* on the same side. The mobility of the neck allows us to bring the *occiput* perfectly and without inconvenience under the *pubes*, that is a fact which no one can doubt of; and its length, which exceeds that of the *symphysis* of the latter, permits us to disengage it entirely by raising it up before the *mons veneris*, as it disengages in a common labour. As the length of the neck posteriorly is then nearly equivalent to that of the *symphysis* of the *pubes*, so the extent of its anterior part, taken from the chin to the top of the breast when the chin is turned backward, at least, equals the length of the *sacrum;* whence we see, that the chin may arrive at the bottom of the *vulva*, before the shoulders and breast quit the margin of the *pelvis*, and without stretching the neck painfully. The extraction of the head is therefore possible in cases where the shoulders, fixed over the superior *strait*, render its expulsion impossible; and I prefer it to that which M. *Levret* recommends. If the shoulders do not descend after the exit of the head, we may remove them more easily and advantageously than could have been done before; because there will then be more room in the *pelvis*. That is the method which I have several times followed in cases of this kind; and which I shall repeat, if I meet with any more of them.

General Rules concerning the Use of the Forceps.

1193. Among the rules to be observed in the use of this instrument, some regard the situation of the woman, and others the mode of operating.

1194. There is but one single position proper in all cases. The woman ought to be laid on her back at the foot of the bed, so that her breech may project a little beyond it; as I have recommended for preternatural labour: and the same precautions must be taken to fix her in that attitude. All other positions seem to me inconvenient, either for the woman or for the operator.

1195. The rules which concern decency must not be neglected: it would be superfluous to point them out to a well bred man.

1196. But those which relate to the application of the forceps, are only known to the enlightened practitioner. We must take care; 1. to warm the instrument a little, to separate its branches, and anoint them with butter or pomatum; 2. to insinuate them separately, and in a different manner, according to the position of the child's head, and the part of the *pelvis* which it occupies.*

1197. The blades of the forceps ought always to be applied on the sides of the head; if there are exceptions to this rule, they are very few in number, and I shall point them out in the sequel. Sometimes

* It is pretty much the custom to conceal the forceps from the woman, for fear of alarming her; but I am of opinion that nothing can encourage her more, than to make her understand them, and allow her to examine them, since we cannot use them without her perceiving it. I have never used them without in a manner receiving them from the hands of the woman herself.

it is best to introduce the male branch first, that is to say, that which has the pivot; and at other times the female branch. I have observed above, that the blades of the forceps ought always to be placed on the sides of the head, except perhaps in one single case which I shall mention in the sequel; but at whatever part of the *pelvis* they are introduced, each of them ought to be preceded by the extremity of one or several fingers, to direct them more certainly to the proper place, and under the edge of the orifice of the *uterus*. There are very few cases where it is necessary to introduce the whole hand into the *vagina* to guide them thus, even if there were space enough to admit it.

1198. We ought never to apply the forceps till the edge of orifice be soft and well dilated, or easily susceptible of farther dilatation. The external parts require the same attention and care. I cannot conceive any case where we ought to have recourse to them before all those parts are in a proper disposition for their application.

1199. We ought never to push the blades of the instrument forcibly in order to carry them to the requisite height. As the obstacles which oppose their progression generally depend only on some folds of the *teguments* of the *cranium*, or of the parts of the mother, we almost always surmount them easily, by varying the direction of the instrument a little. If we sometimes meet with more considerable ones, they proceed from the end of the blade's going with too much force against the head, or against the side of the *pelvis*, so that the curves of the instrument are not exactly adapted to those of the *pelvis* and head. We surmount also these difficulties, by changing the direction which we had hitherto given the instrument; either by raising or lowering the extre-

mity which is without, or by inclining it towards one thigh, or the other, according to the circumstances of the case, which can only be determined by the operator.

1200. When the child's head has already cleared the orifice of the *uterus*, and fills the cavity of the *pelvis*, the fingers of the accoucheur being no longer able to reach the edge of the orifice, to direct the instrument under it, he must carefully observe in the introduction of the blades, to keep their extremities applied as close as possible to the head; in order that they may of themselves pass within the *uterine* circle and avoid pinching the edge of it in the sequel, and that they may not go against the union of the *uterus* with the *vagina*, which would expose that part to be torn, if we were to attempt pushing the instrument farther up by applying more force.

1201. In all cases, we ought to contrive that the head should be grasped, as much as possible, according to its greatest length; that is to say, so that a line which would divide the *sinus* of the forceps into two equal parts, from the junction of the two branches, to the centre of the space between the extremities of their blades, should cross the head obliquely from the posterior extremity of the sagittal *suture*, to the chin, or from the chin to the extremity of the said *suture*; as may be seen in the XVIIIth and XXXVth plates of Smellie.

1202. The pressure which the forceps exert on the child's head while we extract it must always be relative to the proportion which the dimensions of that part bear to those of the *pelvis*. When the latter is well formed, we must not grasp the head very tight between the blades, but only so much as to prevent their slipping. When the *pelvis* is deformed we must grasp the head more strictly; because it

cannot then clear that cavity without diminishing in size, at least in one direction, and without our employing a great deal of force to extract it. It is often necessary in this last case, to bring the handles of the forceps close together, and fix them in that state with a bandage, or a napkin rolled up, which we may wrap round the whole, as far as the parts of the woman; in order to hold the instrument more firmly than we could if it were naked.

1203. When we have applied the forceps on a head stopped or wedged in the superior *strait*, we ought to extract it without expecting any thing from the forces of the mother, and not, after bringing it into the cavity of the *pelvis*, commit the expulsion of it to Nature.

1204. Whenever we use the forceps, we ought to make the head take a course relative to its position, as I have laid it down from actual observation, in treating of the mechanism of the different species of natural labour; that is to say, that we must make it present only its smallest diameters to the small ones of the *pelvis*. See par. 483, and following, to par. 545 inclusively.

1205. We ought never to pull the forceps in a right line, because that would make the head descend with more difficulty; as the celebrated author of that instrument has already observed. But we ought also to set bounds to the rotatory motions which that accoucheur recommends with a view of *unwrinkling* the *vagina*. It is sufficient to carry the external extremity of the forceps a little towards each of the woman's thighs alternately, at the same time that we pull towards us. We must be equally attentive to raise this same extremity insensibly towards the belly of the woman, in proportion as the head engages in the inferior *strait* and the *vulva*. At

this last period, we ought to hold the instrument with one hand, and apply the other against the *perinæum* to support it, and prevent its rupture; as we do in a natural labour. We ought not to take off the forceps till the *parietal protuberances* of the child have cleared the opening of the *vulva.*

1206. The application of the forceps requiring in general fewer precepts, and presenting less difficulty, as the head is nearer to the external parts of the woman, and *vice versa*, I shall first show how we ought to act when the head is entirely in the cavity of the *pelvis;* in order to proceed from the simple to the more complex; and describe the different modes of operating more clearly.

Of the Application of the Forceps in that Position in which the Occiput answers to the Arch of the Pubes, and the Forehead to the Sacrum; and also in that in which the Occiput is against the latter, and the Forehead opposite the Arch of the Pubes.

1207. Of all the positions in which the crown of the head can present at the inferior *strait*, no one is more favourable for its exit and for the application of the forceps, than that in which the *occiput* answers to the arch of the *pubes*, and the forehead to the middle of the *sacrum.* Whether the head be locked, in that direction, or the defect of the expulsive pains, the weakness of the woman, an hæmorrhage, or any other cause, oblige us to have recourse to that instrument, it must be used in the following manner.

1208. The woman being placed as directed in par. 1194, and the following, and every thing properly

prepared we insinuate the male branch of the forceps, towards the left side of the *pelvis*, and the other at the right side. We first introduce two fingers of the right hand, or one only under the edge of the orifice of the *uterus*, at the left side, if they can reach it, or if not, as high as possible on the child's head. With the other hand, holding the male branch of the instrument by its middle, nearly as we hold a pen, we present the end of the blade to the *vulva*, its new curve, or concave edge, being turned towards the *pubes* and its other extremity inclined over the woman's right groin. We slide this blade into the *vagina* along the inside of the fingers which prepare the way for it; and when its extremity has passed them, we begin to change the direction of the external end, and withdraw it a little from the bend of the groin towards which we had kept it inclined. We then lower it insensibly, carrying it towards the woman's left thigh, but only in proportion as the blade advances farther; and we continue this procedure till the blade has penetrated to the height of four or five inches, and the portion of the instrument which is without be nearly parallel to the axis of the woman's *trunk*.

1209. We must slide this branch to the height of four or five inches, that its extremity may be applied somewhere about the angle of the lower jaw, or near the cheek. We may be certain that it is thereabouts and that the blade is well placed, if it will not shake easily, and if the pivot answers to the *symphysis* of the *pubes*, though distant from it several inches, if the forceps I have adopted are used; lastly, if in pulling the instrument in a right line, we perceive a kind of resistance at its hidden extremity.

1210. The height at which we ought to keep the end of the instrument which is without, must be varied a little according to the particular direction

of the *pelvis* of the woman, and the inclination of its axis relatively to the horizon. Although I cannot give positive rules on this subject, I may say, however, that in the case in question the external extremity ought to be elevated so that the portion of the instrument which is in sight, may form, with a line drawn horizontally from the bottom of the *vulva*, between the woman's knees, an angle of from thirty to forty degrees. We suppose here the woman laid on her back, with the breech a little elevated. An intelligent assistant ought to keep this first branch of the forceps in the situation indicated, while we apply the second.

1211. We slide up this last with the same precautions, but holding it with the right hand, and so that the extremity of its handle be at first inclined over the left groin. Two fingers of the other hand, or one only, introduced into the *vagina*, between the head and the right side of the *pelvis*, must guide the blade in its progression. In proportion as it penetrates, we gradually lower the external end, and bring it from the woman's left thigh; so that the opening in this branch destined to receive the pivot of the first, may do it easily, by coming opposite to it. We then unite the two branches, and fix them in that state by giving the pivot a half turn.

1212. We then take hold of the forceps with both hands; that is to say, with the left placed beyond the junction of its branches, near the *pubes* of the woman, and the right at its extremity, as is seen in the eighth plate. We then pull towards us, carrying the extremity of the instrument alternately towards each thigh of the subject; but so that the line it describes in these alternate motions may not exceed seven or eight inches. We likewise raise the end of the instrument insensibly toward the wo-

man's belly, in proportion as the head engages in the inferior *strait*, as I have already observed. When it is advanced so far as to distend the *perinæum*, we must support that with one hand, and pull the instrument only with the other; but acting very slowly, to give the external parts time to unfold, and dilate more gradually. By proceeding thus we make the head describe the same course which it takes when expelled by the efforts of Nature alone, and art should always imitate her.

1213. After the position of the head of which I have just spoken, there is none that requires a more simple procedure than that in which the child's forehead is concealed behind the inferior edge of the *symphysis* of the *pubes*, and the *occiput* lodged in the *sinus* of the curve of the *sacrum*. I have observed in par. 501, and following, that this position was, *cæteris paribus*, much less favourable for the exit of the head than the preceding, and that some women experience so much difficulty in delivering themselves without help in this case, that it would often be better to use the forceps, than to expose them, as well as their child, to the danger of so long and severe a labour. If this position of itself, and exclusively of all other causes, ought not to determine us to recur to that method in most women, at least it becomes necessary when any accidents supervene.

1214. The manner of applying the forceps is absolutely the same as that which has been described for the preceding position.

Method of using the Forceps in that Position of the Head, in which the Occiput answers to the left Foramen Ovale, and the Forehead to the right Sacro-iliac Symphysis; and in that where the Forehead is behind the left Foramen Ovale, and the Occiput opposite the right Sacro-iliac Symphysis.

1215. I HAVE observed in treating of natural labour, that the head usually descended in the first of these positions, and that the *occiput* turned towards the arch of the *pubes*, only in proportion as it began to engage in the inferior *strait*. When the head does not execute this turn, but preserves its first direction, notwithstanding the violent efforts which tend to expel it, if we cannot make it describe that movement with the finger, we must have recourse to the forceps. We must also use them when any accidents supervene which permit us not to leave the delivery any longer to the efforts of Nature. But the mode of using them must be a little different from that which I have just described.

1216. If the general rules which I have established concerning the use of the forceps be recollected, it will be seen that in this position of the head, the male branch ought to be placed towards the left *ischiatic* notch, and the female branch under the right *foramen ovale*, that they may closely embrace the sides of the head. We conduct the first branch with the left hand, holding its external extremity at first very high, and a little less inclined towards the right groin than in the preceding positions. We direct the end of the blade by the help of one or more fingers of the right hand introduced into the *vagina*, beyond the left *sacro-ischiatic* ligament, and

we insinuate it in that direction to the height of four inches or thereabouts, making it cross the fore part of the *sacrum* a little, to reach the cheek of the child, whose face is then towards the right *sacro-iliac symphysis*. Whence we see how attentive we ought to be to lower the external extremity, and incline it in the same proportion towards the left thigh; but in such a manner that the point of the pivot destined to join the two branches of the instrument may remain upward, and a little turned towards the woman's left groin: for otherwise, the greatest breadth of the blade could not closely embrace the convexity of the *parietal* region.

1217. We insinuate the female branch with the same care towards the right side of the *pelvis*, but a little forwarder, so that it may pass obliquely behind the *foramen ovale* and under the *acetabulum*. It must be moreover directed in such a manner as to join easily with the first.

1218. The extremity of the instrument is to be kept at a moderate height above the horizontal plane, and inclined at the same time towards the left thigh, the point of the pivot inclining obliquely toward the groin of that side.* We then take hold of the instrument with both hands, the left placed over it close to the *pubes* of the woman, and the other at its extremity. We compress the head according to the necessity of the case, and turn it in the *pelvis* so as to bring the *occiput* under the arch of the *pubes;* but to do that we must raise the handles of the for-

* The woman is always supposed to be laid on her back, with the breech raised by means of a cushion. But if the breast should be higher than the breech, we should be obliged to keep the handles of the forceps much lower than the point assigned. The direction of the canal of the *pelvis* must be the operator's guide.

ceps, making their extremity describe an arch whose convexity would be towards the left thigh, till it comes to the point indicated in par. 1210, and the point of the pivot be exactly upward. In general this rotation is easily made. We meet with no obstacles to it, but when the *sacrum* of the woman is flattened, or when the child's head has turned a little backward as it advanced, and the forehead is too low with respect to the *occiput*. In this last case, before we endeavour to turn the head round, we must push up the forehead as much as is necessary, as I have directed in par. 953.* After this rotatory motion, the head being reduced to its first position, it is to be extracted as recommended in that position.

1219. There are cases in which we absolutely cannot turn the head in this manner, and in which it would be dangerous not to attempt it cautiously: those cases are excessively rare, and I have met with them, at most, but five or six times. In several of those women, I have seen the head come forth, after a very long labour, in a diagonal situation with respect to the inferior *strait;* and in the others, I have, extracted it by means of the forceps, in a similar position, after having endeavoured to turn it round and bring the *occiput* under the *pubes*. These cases happen when the *sacrum* is straight, flat, and destitute of that curve which gives the middle of the *pelvis* more space than the *straits* have in the direction from before backward.

1220. Though I place next in order, the position in which the *occiput* answers to the right *sacro-iliac* junction, and the forehead to the left *acetabulum*, it

* We ought to attend to this circumstance in all other diagonal positions of the head, when we find any difficulty in making it turn on its axis.

is not because it is the most frequent of all the diagonal positions which the head is capable of taking with respect to the inferior *strait*, after that which I have just described; but because these two positions are exactly the same, if we only consider the relation between the dimensions of the head and those of the *pelvis;* and because the forceps must be placed in the same manner. For in both, the greatest length of the head is parallel to the same oblique diameter of the *pelvis;* one ear answers to the right *foramen ovale*, and the other to the left *ischiatic* notch: it is before the latter and behind the former that we must insinuate the blades to grasp the head properly.

1221. We ought never in this position to endeavour to turn the child's face towards the *sacrum;* because it could not arrive at it without passing over a good third of the internal circumference of the *pelvis;* and that movement could not be executed without giving the child's neck a dangerous, and perhaps a mortal twist.

Method of using the Forceps, 1. *in that position in which the Occiput answers to the right Foramen Ovale, and the Forehead to the left Sacro-ischiatic Notch;* 2. *in that in which the Occiput is placed opposite the said Notch, and the Forehead behind the right Foramen Ovale;* 3. *when the Crown of the Head is situated exactly across at the inferior Strait.*

1222. When circumstances require us to recur to the forceps in that position of the head in which the *occiput* answers to the right *foramen ovale*, we must insinuate the male branch obliquely behind the

left *foramen ovale*, holding it with the left hand, and directing it with some of the fingers of the right introduced towards that part. In proportion as it penetrates, we lower its external extremity, which we held very high at first, and inclined towards the thigh, but so that the point of the pivot which serves for its junction with the other branch, may always be towards the groin of that side. We afterwards slide up the other branch, which we hold with the right hand, between the child's head, and the right *sacro-ischiatic* ligament of the mother, directing it with one or more fingers of the left hand. We pass it on in the direction of the *sacro-iliac symphysis* of that side, crossing the fore part of the *sacrum* a little, and observing to lower the external end in proportion as it penetrates, till the opening destined to receive the pivot of the first branch, meets it; we then join them together, and fix them; and afterwards take hold of the extremity of the instrument with the left hand, and place the right towards its middle, near the parts of the woman; then we turn the head in the *pelvis*, in order to bring the *occiput* under the arch of the *pubes*, to extract it afterwards as if it had presented originally in the first position. See par. 1212.

1223. The relation of the dimensions of the head to those of the *pelvis*, being absolutely the same in the position in which the forehead answers to the right *foramen ovale*, and the *occiput* to the left *ischiatic* notch, as in the preceding, the forceps must be applied according to the same principles, when circumstances require their use.

1224. It is excessively rare for the child's head to present its greatest length exactly across at the inferior *strait*, so as for one ear to answer exactly to the *symphysis* of the *pubes*, and the other to the middle

of the *sacrum*. And the best method of applying the forceps in that case differs so little from what I have recommended for the diagonal positions, that I might have confined myself to them, without leaving a great deal to be added after me. These transverse positions can only be two in number: in one the *occiput* answers exactly to the left side of the *pelvis*, and in the other to the right.

1225. To apply the forceps conformably to the principles I have established, we are to introduce the female branch of the instrument directly under the *pubes*, and the other before the *sacrum*, in the first of these two cases; always keeping their external extremities inclined towards the left thigh of the woman. When they are well placed, united, and fixed, we take hold of the end of the instrument with the right hand, and the middle part with the left; then turn the head so as to bring the *occiput* under the *pubes*, and afterwards extract it in the manner directed for the most favourable position.

1226. In that transverse position, in which the *occiput* answers to the right side of the *pelvis*, we must introduce the male branch of the forceps directly under the *pubes*, and the female before the *sacrum;* with the precaution of inclining the extremities of both towards the right thigh of the woman. Having then taken hold of the middle of the instrument with the right hand, and of the extremity with the other, we turn the *occiput* under the arch of the *pubes*, as in the preceding position; and terminate the delivery in the same manner.*

* These cases offer much more difficulty to the application of the forceps than the preceding; and two cases have occurred, where I found it impossible to apply them in this direction; I therefore changed the situation of the head to the diagonal, by using one of the blades of the forceps as a lever; I

Causes which ought to determine us to use the Forceps, while the Head is still above the superior Strait; and general Rules to be observed in it.

1227. It is often so difficult for those who are not well versed in the use of the forceps, to take a good hold of the head with that instrument, when it is still above the *pelvis*, and so many inconveniences may result from it, that we ought never to attempt it but when the circumstances, which complicate the labour, leave us no hopes of employing any method more gentle or more certain. Although the difficulties are less for those who have a rational habit of using the instrument, who perfectly know its relations to the child's head and the *plevis* of the mother, they are nevertheless great enough to prevent our preferring it to other methods sometimes equally practicable. The accidents which require us to deliver, while the head is still far off, are not sufficient to determine us to give that preference to the forceps. A defect of size in the superior *strait*, relatively to the volume of the head, ought alone to induce us to do it; and even then there ought to be space enough to give hopes of bringing the child with less danger, than by turning it, and extracting it by the feet.

1228. Although there are fewer accidents to be feared in carrying the forceps so far, when the *pelvis*

then very easily applied the instruments and extracted the head. I would therefore recommend this mode in preference to the other; to effect this change we apply a blade of the forceps, on the *vertex* and depress it, and at the same time incline it towards the *foramen ovale*, or the arch of the *pubes*. If the *vertex* is to the left side of the *pelvis* we use the male blade and *vice versa*.

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is well formed, than in the contrary state, since there is more space for applying them, and the parts of the woman, as well as the child's head, will not suffer so strong a pressure from them, yet we ought not in that case to use them; because the more moveable the head is over the brim of the *pelvis*, the more difficult it is to take hold of it properly. The extraction of the child by the feet then merits the preference, after the usual preparations, if the state of the *uterus* requires them: that method is more easy for the greater part of practitioners, and safer for the woman, in their hands, than the use of the forceps.

1229. If we are not founded in preferring the forceps, but when the superior *strait* is contracted, neither are they always proper when it is so much so that the head cannot engage in it; an extreme deformity much less admitting the use of that instrument than a good conformation. In the latter case, we only reject it because it seems preferable to turn the child, and because its application requires an extent of knowledge which the greater part of those who devote themselves to the practice of midwifery do not possess, and which they cannot acquire by reading: in the other case it is totally inadmissible.

1230. We ought to take great care in all cases, but particularly in that where the narrowness of the superior *strait* obliges us to recur to the forceps, to fix its branches in such a manner, that we may by their help place the diameters of the head in a proper relation to those of the *pelvis*, and diminish, according to the necessity of the case, that which is to pass in the direction of the smallest diameters of the *straits:* which I shall more particularly exemplify in the following sections. I shall suppose

in all these cases that the length of the smallest diameter of the superior *strait*, is less than three inches and an half, and more than two inches three quarters.

Method of using the Forceps in that Position of the Head in which the Occiput rests on the Top of the Symphysis of the Pubes, and the Forehead against the Sacro-vertebral Angle; and in that where the Occiput answers to the said Angle, and the Forehead to the Pubes.

1231. In the first of these positions, which is excessively rare at the beginning of labour, the impossibility of the woman's delivering herself without help, often arises much less from the bad conformation of the *pelvis*, than from the manner in which the child's head presents itself to it. It is then its greatest diameter which tends to pass in the direction of the smallest diameter of the superior *strait*, which cannot take place, unless this last be nearly of its natural length. To change the direction of the head, would be sufficient to put the woman into a condition to deliver herself without farther help, if the bad conformation of the *strait* in question were but moderate, and left it three inches and a quarter, or three inches and an half in its little diameter.

1232. When we judge the use of the forceps preferable to any other method, we must apply the blades to the sides of the head, sliding them up along the lateral parts of the *pelvis*, to an equal height; which must be seven or eight inches at the least, if we would have them grasp the head closely

and properly. My rule on this subject, when the forceps I have adopted are used (see par. 1106), is to slide up the branches, till the part destined for their junction touches the edges of the *vulva*.

1233. As it is difficult to reach high enough on the sides of the head, to direct the blades of the forceps with certainty, by passing only two fingers into the *vagina*, as directed in all the cases stated in the preceding article, we may introduce the whole hand except the thumb. As we ought to introduce the male branch of the forceps first, and hold it with the left hand, we introduce the fingers of the right hand under the edge of the orifice of the *uterus*, before the left *sacro-iliac symphysis*, to guide the end of the instrument thither. When we have carried the instrument a little beyond the ends of the fingers, we are to bring it exactly on the side of the head, and of the *pelvis;* but by slow degrees, and in proportion as it penetrates farther. We are to observe at the same time to lower the extremity which is without, and much more than if the head occupied the cavity of the *pelvis;* setting however different bounds to it, according to the particular inclination of the *pelvis* of the woman relatively to the horizon, and according as the curve of the *sacrum* shall be more or less considerable, &c.: which can only be determined by the operator himself.

1234. The female branch is to be placed with the same care on the other side, conducting it with the right hand, while with some of the fingers of the left, introduced at the entrance of the *uterus*, we direct its extremity within the neck of that *viscus*, opposite the right *sacro-iliac symphysis*, from whence it is to be brought insensibly opposite to the other branch; so that at first it covers the side of the forehead, and afterwards the *parietal* convexity.

1235. The two branches being united, we are to compress the head as much as is necessary, by bringing their extremities more or less together, and fixing them so by means of a garter or the corner of a napkin. We are then to turn the length of the *cranium* from the direction of the little diameter of the superior *strait*, inclining the *occiput* towards one of the sides of the *pelvis*, or if the *strait* be moderately narrow, only as far as the *acetabulum:* but preferably to the left. In order to that, we are to hold the instrument with both hands, the right placed at its extremity, and the left near the parts of the woman, in such a manner that the fore-finger of the latter introduced into the *vagina*, may constantly touch the top of the head, between the two blades. The greatest care must be taken, in proportion as we turn the head over the superior *strait*, to lower the handles of the forceps, as much as the external parts of the woman will permit, carrying them, at the same time, insensibly towards the left thigh.

1236. It is in this direction, downward and towards the woman's left thigh, that we must pull the instrument to bring the head into the lower part of the *pelvis*. Without that precaution we should not succeed, either in changing its position, or bringing it down; and we should exceedingly bruise the internal soft parts of the *pelvis;* as we may be convinced by only reflecting on the natural direction of that bony canal. It is the ignorance of most accoucheurs, in this respect, which has rendered their efforts fruitless; which has induced them to think and publish that the forceps cannot be usefully applied while the head is still above the *pelvis*, and to accuse those of insincerity who affirm that they have reaped the same advantage from them then, as when it occupies the bottom

of the *pelvis*. The precautions I have recommended are so necessary, that the omission of only one may render all the rest useless.

1237. When the head is come into the cavity of the *pelvis*, we raise the extremity of the forceps a little, but keeping it nevertheless inclined towards the woman's left thigh. Afterwards we change the direction of the head again, and bring the *occiput* under the arch of the *pubes*, over which it was at first: proceeding for that purpose, and in the sequel, as directed in par. 1218, and following.

1238. If, contrary to all expectation, the superior *strait* should not be found narrower from side to side, than from before backward, as it has been seen, though very rarely, we ought to bring down the head in its primitive direction: but then it would be proper to raise the forehead as much as possible above the *sacro-vertebral* angle, that the top of the *occiput* may present more perpendicularly at the superior *strait*. By that means, it will be the height of the head taken from the summit to the base, which will correspond with the diameter which goes from the *pubes* to the *sacrum*, and not the length of the *cranium* as before; which will render its descent much easier.

1239. The position in which the forehead rests against the top of the *symphysis* of the *pubes*, and the *occiput* on the *sacro-vertebral* angle, is still more rare than the last. It is also less favourable for delivery, because the face is upward, and after having turned it on one side, to favour the passage of the head through the superior *strait*, we cannot dispense with bringing it back again under the *pubes*.

1240. We must operate in the same manner as in the preceding case, with respect to the application of the forceps.

Method of using the Forceps when the Head, retained above the superior Strait, presents the Occiput at the left side, and the Forehead at the right: and also when the Forehead answers to the left side, and the Occiput to the right.

1241. The greatest length of the head seldom presents so diagonally at the entrance of a *pelvis* contracted in its little diameter, as we find it in a natural labour; nor is it more common to find it exactly transverse. But suppose that its great diameter should cut the superior *strait* obliquely in this case, as in that where the *pelvis* is well formed, it could not remain in that diagonal situation during the application of the forceps; because, being moveable on the superior *strait*, it yields to the pressure exerted on one of its sides, by the introduction of the first blade of the instrument, and places itself so nearly across, that we may, with respect to the application of the forceps, consider it in that situation.

1242. If the child's head, resting on the margin of a contracted *pelvis*, could be fixed in one of the diagonal positions which we generally observe when the *pelvis* is well formed, we might apply the blades of the forceps much more easily on the *parietal* regions, by following the rules which I have laid down respecting each of those positions, when the head occupies the lower part of the *pelvis:* observing only to slide the instrument higher, and lower its external extremity more. The forceps might be applied with still much less trouble, if we could previously, with the hand, reduce the head to one of the positions which I have described

in the preceding section; that is to say, bring the *occiput* or the forehead over the *pubes;* as is clearly seen by considering the relation of its dimensions to those of the superior *strait:* but, unfortunately, the time when we might hope to do that, is often long elapsed, when we are called to operate. I shall then consider all these positions as transversal, or nearly so, since it is in that direction, as we have already seen, that the length of the head must be placed to bring it down, when the superior *strait* is contracted to the degree stated in par. 1230.

1243. To operate conformably to the principles dictated by the very nature of the obstacle which opposes delivery, in the transverse positions of the head in question, we must place the blades of the forceps on the ears; consequently, one before the *sacrum*, and the other under the *pubes*. The introduction of the first is easy enough, but that of the second requires care, knowledge and dexterity.

1244. We must place the female branch under the *pubes*, and the male branch before the *sacrum*, whenever the *occiput* answers to the left side of the *pelvis*. It is also necessary to introduce that first which is to be under the *pubes*, because the difficulties which oppose its progression towards that part, would be augmented by the presence of the other branch if that were already introduced behind, that is to say, before the *sacrum*. To place the first properly, we must begin by directing it with some of the fingers of the left hand introduced into the *vagina* under the edge of the orifice of the *uterus* before the right *sacro-iliac symphysis;* and advance in that direction till the blade closely embraces the side of the forehead It is not till then that we ought to begin to bring it towards the *pubes*, to place it under the *symphysis*, by passing it over the face and temple

of the child. But to make it execute that movement more easily and certainly, we ought to apply the fingers, introduced into the *vagina*, under the convex edge of the blade, and push it from behind forward with respect to the *pelvis;* while, with the other hand, we lower the external extremity as much as we can, turning the point of the hook which terminates it insensibly downwards, till it be directly towards the floor.

1245. Before we withdraw the fingers from the *vagina*, which have served for a guide to the first blade, we insinuate the second along the *sacrum*, and within the posterior edge of the orifice of the *uterus;* placing it in such a manner relatively to the body of the other, that when it is introduced to a proper height, they may naturally join. It is also to be held with the right hand, the handle very high and inclined towards the left *os pubis*, the end of the blade low, and its concave edge obliquely regarding the woman's left thigh. It is to be introduced flat, under the head and passed up along the *sacrum;* which is to be effected by insensibly lowering the handle which at first was held very high.

1246. As to the extraction of the head, it must be performed as I have prescribed in par. 1235, and following.

1247. The position in which the *occiput* answers to the right side of the superior *strait* being the same as the preceding, as to the relation of the dimensions of the head to those of that *strait*, we must use the forceps agreeably to the principles established for that. But the male branch must be placed under the *pubes*, and the female branch before the *sacrum;* in order that their new curve may answer to the *occiput*, which must be brought under the anterior arch of the *pelvis*, as soon as the head shall be descended into that cavity.

Method of using the Forceps, when the Head presenting the Vertex, is wedged in the superior Strait.

1248. Hitherto we have spoken of the use of the forceps, only in cases where the head of the child was free in the cavity of the *pelvis*, or above the superior *strait:* it is now time to treat of those in which it is locked in that *strait*. Although this state differs little from that in which the head is still above the *pelvis*, as to the application of the instrument, yet in order to explain them with more clearness and precision, I thought it best to treat of them in two separate articles.

1249. I shall repeat here, that the child's head may be locked either with its length, or its thickness, between the *pubes* and *sacrum*, and that it must then be in one of the four positions stated in the preceding article.

Method of using the Forceps, when the Head is locked lengthwise, between the Pubes and Sacrum, superiorly.

1250. The head locked lengthwise, may present the *occiput* or the forehead against the *pubes*, which constitutes two positions essentially different, but which are the same were we to consider them only with respect to the relation which the dimensions of the head bear to those of the *pelvis*, and the mode of operating necessary to terminate the delivery. In both, the longitudinal diameter of the head is parallel to the little diameter of the entrance

of the *pelvis;* in both it is the *occiput* and forehead which are in contact with the anterior and posterior parts of that cavity, while the sides are free.

1251. For the head to be locked in that direction, the little diameter of the superior *strait* must be of such an extent, that the head might pass it without much difficulty, in a transverse position: which indicates the course we ought to make it take with the instrument, in order to extract it.

1252. We must place the branches of the forceps on the sides of the head and of the *pelvis*, with the same precautions laid down in the second section of the preceding article, par. 1232, and following; except that they are not to be passed so high by about an inch and an half; and when fixed, we are to keep the handles a little less downward and backward than directed in par. 1233, 1236, &c. We ought never to attempt to bring down the head in either of these two positions; because by pressing it on the sides with the forceps, far from diminishing its length from the forehead to the *occiput*, it must augment the force of the contact of those parts with the *sacrum* and the *pubes;* increase the frictions of the head, and render its descent more difficult and laborious, both for the mother and child. We must then begin by giving it a transverse situation, in order to place its smallest diameter in the direction of the smallest diameter of the superior *strait*. To procure this change with less difficulty, we are to unwedge the head, by making it rise above the part where it is locked, which is easily done; not by pushing it directly upwards with the forceps, but by shaking it a little, and carrying the extremity of the instrument alternately and repeatedly towards each of the woman's thighs; in the same manner as we would shake a nail to draw it with a pair of

pincers.* We may be convinced of the possibility of unwedging the head, and pushing it up, by shaking it in this manner, if we recollect the form which it takes in locking, and that its base or greatest breadth is then above the two points of contact which fix it and hinder it from descending; and moreover, that we push it back from a narrower space into a wider. See par. 1156.

1253. When we have unwedged the head, by shaking it thus, and pushing it up, we are to turn the *occiput* or the forehead from over the *symphysis* of the *pubes*, according as it is the one or the other which is found there, and we direct it preferably towards the left side We bring down the head in this new position to the bottom of the *pelvis*, and as soon as it is arrived there, we are to turn the part which was over the *symphysis* at the beginning, under the arch of the *pubes:* and afterwards finish the delivery as usual. In these different periods of the operation, we are to observe all that is prescribed in the paragraphs 1233, and following, to 1240 inclusively.

Method of using the Forceps when the Head is wedged transversely in the Superior Strait.

1254. This species of locking cannot take place but when the small diameter of the superior *strait* is less than three inches and an half, or when the head is much more voluminous than usual; because its thickness does not commonly exceed that, and it does not stop and become locked, till after it has

* Experience has often confirmed the truth of all the propositions contained in this paragraph.

suffered some reduction in that direction in which it undergoes the greatest friction. When the head is fixed thus, we ought to endeavour to push it up with the hand, as *Smellie* advised; and afterwards conduct the branches of the forceps in the same order, and according to the same directions which I have prescribed in the third section of the preceding article. If we cannot accomplish the putting it back in this manner, we must apply the forceps at the sides of the *pelvis*, placing one branch on the face and the other on the *occiput*, taking care to slide them both up to the same height; for otherwise they could not be joined. But it seems to me out of all probability that a case should ever happen in which we could not push back a head wedged only in the superior *strait*, since the part where it preserves the greatest thickness is then always above that *strait*. See par. 1253 and 1156. We must not confound this case with that which is the subject of the following paragraph.

1255. If we admit it to be impossible to push back a head strongly wedged with its sides against the *pubes* and *sacrum*, we must apply the forceps to the sides of the *pelvis*, consequently on the face and *occiput* of the child. Though in that case it is not exempt from inconveniences, it has not all which I have attributed to it in the transverse positions of the head above the *pelvis;* Nature having, before the application of the forceps, effected almost all the reduction of its thickness, necessary for its passage through the superior *strait;* since it is already wedged in it, which could not be without its advancing at least a third, or even the half of its length.

1256. When we are reduced to the necessity of following this method, we are to change the situa-

tion of the blades of the instrument as soon as the head has cleared the superior *strait*, and place them on the ears, in such a manner that their concave edge may be towards that side of the *pelvis* which answers to the *occiput;* in order to bring it under the arch of the *pubes,* and finish the delivery as usual.*

Method of using the Forceps and the Lever, when the Child presents the Face.

1257. I HAVE already demonstrated what a number of obstacles Nature has to encounter in delivering herself without help of a child presenting the face, and how much difficulty we find in assisting her, when we are not called early enough to operate at the moment of the evacuation of the waters of the *amnion.* In establishing the essential indication presented by this kind of labour, in which the child's head is constantly turned backward, I have also observed that we could not always fulfil it, that is to say, correct this bad situation with the hand alone, and that it is sometimes necessary to use the lever for that purpose. In many of these cases, the forceps cannot be applied with advantage but after

* A case occurred to me some years since, where I was obliged to apply the forceps on the face and *occiput*, in consequence of the fore arm being between the head and *sacrum;* small force was sufficient to bring the head in the *vagina;* the forceps were then removed and placed at the sides of the head; the child was delivered living and healthy—this case was witnessed by Mr. now Dr. Brown.

From this it would appear that cases may occur, where we are obliged to depart from the ordinary mode of practice.

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the lever; and though we are sometimes obliged to use them first, it does not always dispense us from recurring to the lever in the sequel, as we shall see in the following sections: but in all those cases, a branch of the forceps may be substituted for the lever, and procure the same advantage.

Method of using the Forceps and the Lever in that Position of the Face, in which the Forehead answers to the Pubes, and the Chin to the Sacrum; as well as in that in which the Forehead is against the latter, and the Chin towards the former.

1258. We very seldom meet with the position of the face in which the forehead answers to the *pubes* and the chin to the *sacrum;* and when it happens, we still seldomer see the head descend, and advance as far as the bottom of the *pelvis*, at least unless the latter be extremely large: the head generally stops in the superior *strait.*

1259. When we find the head entirely engaged at the time we are obliged to operate, we endeavour to correct its bad position with the hand alone, as prescribed in par. 1002. If we cannot accomplish it, we insinuate the lever behind the *symphysis* of the *pubes*, carrying it along the crown of the head till it is above the posterior *fontanelle*, in order, as it were, to hook the *occiput* with the end of the instrument.* The accoucheur then pulling the lever almost directly downwards, must endeavour to make the back of the head descend, while with the

* It is on that account that I prefer a lever a little more curved and broader than the common one.

extremities of the fingers of the other hand properly applied on the sides of the face, he tries to push up the chin towards the base of the *sacrum*. Notwithstanding the objections which may be made on this procedure, the difficulties and uncertainty of which I know as well as any one, I nevertheless propose it, because it is more conformable to the principles of the art than those we find described in authors, and because, if it should not succeed, the attempt would be attended with fewer inconveniences.*

1260. When the head remains very high, and fixed between the *pubes* and *sacrum*, if we cannot rectify it with the hand, in order to commit its expulsion to the efforts of Nature; nor remove it to search for the feet, either because that removal is impossible, or because there would be too much danger in turning the child; we must introduce the blades of the forceps on the sides, as if it presented the *vertex* in the first position, that is to say, with the *occiput* behind the *pubes*. We are then to give it a transverse position, and pull it down into the cavity of the *pelvis;* where being more at liberty, we may more easily accomplish the pushing up the face, and bringing down the *occiput*. For that purpose, while we make the head advance by pulling the forceps with one hand, taking care not to grasp it very tight, with the ends of the fingers of the other hand properly disposed on the sides of the upper jaw, we must support the lower part of the face, to hinder it from advancing so much as the *occiput*, and make the head turn in some measure, even in its progression, between the blades of the instrument.

1261. When we do not succeed at first, in bend-

* I am convinced from many trials made on the machine that the *vertex* can never be reduced by this method. W. P. D.

ing the head forward on the breast, as much as is necessary to enable it to clear the inferior *strait* easily, we must again push up the face as soon as it is entirely in the lower part of the *pelvis;* taking care then to grasp it less tight between the blades of the *forceps*, that it may move more freely between them. If we cannot in that manner accomplish the proposed design, we must withdraw one of the branches of the forceps, and use the other as a lever to bring down the *occiput:** but in doing that, we must have a regard to the side of the *pelvis* to which we have turned the child's forehead; for both places cannot be used indiscriminately in all cases. When we have turned the forehead towards the left side of the *pelvis*, we withdraw the female branch, and direct the other on the *vertex* and top of the *occiput*, to bring down the latter; as directed for the transverse position mentioned in par. 1268 and following. If we have turned the forehead to the right side of the *pelvis*, we must withdraw the male branch of the forceps, and use the female branch as a lever, according to the principles already stated.

1262. After having sufficiently brought down the back of the head, and reduced it to one of its natural positions, if we think proper to extract it, we replace the branches of the forceps on the ears; consequently, one before the *sacrum*, and the other behind the *pubes;* but so that their concave edge may be towards the *occiput.* We turn that under the anterior arch of the *pelvis*, to finish the delivery

* This I conceive to be the true method of acting in this case; it should therefore be immediately adopted, as soon as the head has been made to descend; as it must be fruitless to attempt acting with the hand as recommended, while the forceps occupy the *vagina.* W. P. D.

as in those cases where the *vertex* presents in one of the tranverse positions which have been already described. If we suppose the woman able to deliver herself and without inconvenience, instead of replacing the branches of the forceps in the manner indicated, we withdraw that with which we had lowered the *occiput*, and wait for the expulsion of the head, which soon takes place when things are well disposed for it.

1263. It is not only to change the position of the face with respect to the superior *strait* and bring down the head to the bottom of the *pelvis*, where we may, in some cases, rectify it with less inconvenience, that I have recommended the forceps, but also to extract it in that very position in which it has advanced; either when we absolutely cannot rectify it, that is to say, raise up the face and lower the *occiput*, or when we cannot do it without great danger to the mother: as when the head is strongly wedged, or the *uterus* strictly contracted and closed on the child. We then prefer the forceps to bring the head along in the attitude we find it in, because fewer inconveniences result from it to the child, than would in any other method, to both child and mother. We place them on the sides of the head, and disengage it in the position stated in par. 1258, and in that which will be stated in par. 1264, when ever we find them in those positions. But if the face be situated transversely with respect to the inferior *strait*, we first reduce it to the latter,* as directed by *Smellie*. My brother obtained all possible success from this method, in a case of this last species, though the head

* That is, to the situation mentioned in par. 1264. W. P. D.

had been far advanced for more than forty-eight hours: the midwife not having discovered that the face presented.

1264. The position of the face in which the forehead rests against the *sacrum* and the chin against the *pubes*, is still more rare than the preceding; and it is equally difficult for the head then to advance to the bottom of the *pelvis*, even when it is well formed. If however it is so far advanced at the time we are called to the assistance of the woman, we must endeavour to push up the face behind the *symphysis* of the *pubes*, till the posterior *fontanelle* answers to the point of the *sacrum:* and when the hand alone cannot make it execute that movement, we must use the lever. But though its application appears easier and more certain in this than in the former case, we must not however flatter ourselves that we shall always be able to obtain the desired success from it, so many obstacles we sometimes meet with. To apply that instrument advantageously in this case, we must slide it along the *sacrum* and the crown of the head above the posterior *fontanelle*, which is easier to execute than in the preceding position; and endeavour to bring down the *occiput*, while we push up the face with the extremities of the fingers in the prescribed direction. When the face presents in this position at the inferior *strait*, it may happen, if the head be very small relatively to the *pelvis*, that the chin may appear at the top of the *vulva* and engage under the the arch of the *pubes*. In that case, we must not endeavour to push up the face behind the *symphysis*, as in the preceding circumstance, but only to bring down the *occiput* with the lever till it has cleared the bottom of the *vulva*. What I have said in par. 1293, may be consulted, as well for the

manner of applying the lever, as of performing the extraction of the head.

1265. The difficulty of carrying the lever far enough for its extremity to embrace the top of the *occiput*. when the head is only engaged in the superior *strait*, in this position; and the impossibility of doing it when it is strongly wedged between the *pubes* and *sacrum*, sometimes oblige us to employ the forceps first, to remove it, and bringing it into the cavity of the *pelvis*, where we find less difficulty in rectifying it.

1266. In this case we are to place the instrument at the sides, as in the preceding position, and turn away the chin from the *symphysis* of the *pubes*, carrying it towards the left side of the *pelvis*, till the face be placed across. The head is to be brought down in that state, proceeding as for the second position of the *vertex* above the superior *strait*. See par. 1239. When it is brought into the cavity of the *pelvis*, we may try to rectify it in the *sinus* of the forceps, holding it loosely for that purpose. But if we cannot do it so, we must withdraw the male branch of the instrument, and place the other on the *vertex* which answers to the right side of the *pelvis*, to endeavour to bring down the *occiput;* while we push up the face and assist the action of the lever by means of the fingers of the right hand properly disposed on the sides of the nose under the cheeks, as I have recommended to be done in the transverse positions of the face. See par. 1268, and following.

1267. After having sufficently lowered the *occiput*, and rectified the head, if circumstances require us to extract it, we must replace the blades on its sides, so that the male branch may be under the *pubes* and the other before the *sacrum;* to bring

the forehead upward or towards the arch of the *pubes*, and finish the delivery in the manner recommended for the second position of the *vertex* or crown of the head.

Method of using the Forceps and Lever in the transverse Position of the Face, in which the Forehead answers to the left Side of the Pelvis, and the Chin to the right Side; and in that in which the Forehead is towards the right Side, and the Chin to the left.

1268. When the face presents across, as it may advance much farther than in the preceding positions, we commonly find it in the lower part of the *pelvis* when we are called in second to deliver the woman, and sometimes we can no longer rectify it with the hand alone, nor remove it to search for the feet. *Smellie* recommended in that case to apply one branch of the forceps under the *pubes*, and the other before the *sacrum*, to bring the head entirely down, and, afterwards turn the chin under the anterior arch of the *pelvis*, in order to extract it in that position. But the forceps cannot be very salutary in this case, at least, till the head has been rectified, that is, till we have pushed up the chin on the top of the child's breast, and brought down the *occiput*. That is what M. *Levret* intended when he advised to carry one of the branches of of the forceps on the occipital region of the child, and to use it like a lever.* The views of that celebrated

* This method is what M. *Levret* dictated in his private lectures.

accoucheur would have been excellent, if he had not recommended to bring the face afterwards under the *pubes;* that is the only defect in his method. It is much better to turn the face downward, than to bring it upward, when we have it equally in our power to turn it one way or the other.

1269. Though we may use one of the branches of the forceps instead of the common lever, to rectify the position of the head, it is not indifferent which we make choice of; the male branch is the only one proper to be used in that transverse position of the face in which the *vertex* answers to the left side of the *pelvis* and the chin to the right, as the female branch is to be employed exclusively in the position which I shall describe next.

1270. We introduce the former at the left side of the *pelvis*, and along the crown of the head, till its extremity reaches beyond the posterior *fontanelle*, and its curve exactly embraces the convexity of the *occiput*. We then take hold of the instrument with both hands, *viz.* the right placed at its extremity, and the other close to the parts of the woman. We then pull towards us, in a line parallel with the woman's left thigh, which I suppose extended, till the *occiput* be brought sufficiently down; observing to replace the instrument properly as often as it slips from over the head; for we very seldom succeed at the first trial. To favour this movement of the head, we are sometimes obliged to push up the face with the ends of some of the fingers of the left hand, while with the other we pull down the occipital region by means of the lever: which cannot be done unless we place the thumb of the first hand so as to serve for a *fulcrum* to the instrument.

1271. After having sufficiently brought down the *occiput*, and pushed the chin up to the breast, we may commit the delivery to Nature; or if circumstances require us to deliver the woman without delay, we may apply the two branches of the forceps on the sides of the head: proceeding conformably to the principles established for that position of the *vertex*, in which the *occiput* answers to the left side of the *pelvis*. See par. 1225.

1272. The transverse position of the face in which the forehead answers to the right side of the *pelvis*, and the chin to the left, presents the same indications as the preceding, being perfectly similar to it, with respect to the relation of the dimensions of the head to those of the *pelvis* If we cannot with the hand alone rectify the head which is turned on the child's back, we must make use of the lever, or the female branch of the forceps.

1273. When we have properly rectified the position of the head, we are to use the forceps to extract it, if circumstances do not permit us to leave the expulsion of the child to the efforts of the woman. But then the male branch of the instrument must be placed under the *pubes*, and the female branch before the *sacrum;* to enable us to bring the *occiput* under the anterior arch of the *pelvis*, as in that transverse position of the head in which the *occiput* answers to the right side. See par. 1226.

1274. There are circumstances, though indeed extremely rare, in which we are obliged to deviate from the rules I have just laid down with respect to the transverse positions of the face, and in which we cannot rectify the head and reduce it to its natural situation, nor turn the child and extract it by the feet: because, on one side, the head is too far ad-

vanced and wedged in the *pelvis;* and on the other, the *uterus* is too much contracted, too tight, and painful, and the child's life also too uncertain. In these extraordinary cases, in which the established principles are not applicable, and in which the woman alone seems to merit all our attention, we must extract the head with the forceps, as *Smellie* did, and in the manner already described in par. 1263.

Method of applying the Forceps, when the Head is retained by its Base in that Position in which the Occiput answers to the Pubes, and the Face to the Sacrum; and in that where the Occiput is against the latter, and the Face towards the Pubes.

1275. In the first case, after having disengaged the child's arms, and wrapped them up in the same napkin which is round the *trunk*, we raise the whole properly towards the woman's belly, in which situation it must be supported by an assistant. Then we insinuate the branches of the instrument at the sides of the *pelvis*, with the same cautions, and in the same manner, as in the first position of the crown of the head; attending only to the height of the base of the *cranium*, that their blades may be advanced more or less, and their external extremities properly lowered. When the two branches are united and fixed, we draw down the head, making it describe a different course, according to the part of the *pelvis* which it occupies, and the *straits* which it has to clear.

1276. When it is only stopped at the inferior *strait*, we pull with the right hand at the extremity of the forceps, raising it insensibly as the face advances

towards the lower part of the *vulva*, and continue to do so till the forehead is without; while we support the *perinæum* with the other hand, to prevent its rupture.

1277. When the head is still above the *pelvis*, we carry the blades of the forceps farther than in the preceding case, and keep their extremities much lower. We afterwards take hold of the extremity with the right hand; and the middle of the instrument with the left; we remove the head, and give it a transverse situation with respect to the superior *strait;* but turning the *occiput* preferably towards the left side of the *pelvis*. If the head should be engaged and wedged in the superior *strait*, before we turn it transversely we should shake it a little and push it up a few lines, carrying the extremity of the forceps alternately towards each of the woman's thighs, as directed in par. 1818. In turning the head afterwards to give it the transverse position indicated, we must lower the end of the instrument more and more, and carry it a little towards the woman's left thigh. It is also in that direction that we must pull to bring the head into the cavity of the *pelvis;* but as soon as it is there, we are to turn the head again, to bring the *occiput* behind the *symphysis* of the *pubes*, and continue to extract it, as directed in the preceding paragraph; that is to say, by insensibly raising the extremity of the forceps, and pulling them towards us.

1278. The person who supports the body of the child, must make it follow the same movements which are given to the head. While the accoucheur turns the *occiput* towards the left side of the *pelvis*, the child's back must be inclined towards the woman's left groin, and be turned upward again as it was before, when we bring the occipital region

behind the *symphysis* of the *pubes*. The same precautions are to be observed in the positions I am going to describe.

1279. When the head stopped by its base, presents the *occiput* to the *sacrum* and the face to the *pubes*, instead of raising the child's *trunk* towards the belly of the mother, as directed in par. 1275, we must carry it a little backward, where it is to be supported in that position by an assistant, and wrapped up in a linen cloth, in which the arms are to be included also. The blades of the forceps are to be introduced as in the preceding position; but above the body of the child, conducting them with the ends of some of the fingers, till they are beyond the sides of the lower jaw. The extremity of the instrument is to be kept a little higher than in the first case, if the head occupies the lower part of the *pelvis;* and as low as possible, without hurting the child, when it is stopped at the superior *strait*.* After having placed the instrument properly, we proceed to the extraction of the head in the following manner.

1280. When it is still in the superior *strait*, we shake it a little, to enable us, first to push it up, and afterwards to turn the face from behind the *pubes*, more easily; which is not difficult to do, if

* When the child's head is still so high, if we find too much difficulty in introducing the branches of the forceps above the body of the child, on account of the impossibility of lowering the extremity of the instrument so much as we do in the preceding position, we must, as in that, raise the *trunk* of the child towards the belly of the mother, and try to carry the instrument underneath. But some inconveniences would result from it afterwards in making the head take the course prescribed in par. 1281; inconveniences which can only be avoided by withdrawing the instrument, when the head shall be descended into the cavity of the *pelvis*, and by replacing it as in the transverse position which I shall describe next.

we take care, while we turn it, to lower the extremity of the instrument, and incline it towards the thigh of that side to which we direct the face; but I would recommend the left preferably. Having placed the greatest diameter of the base of the *cranium* according to the greatest diameter of the superior *strait*, we are to pull the instrument in a direction which would tend to pass under the woman's left thigh, to bring the head into the cavity of the *pelvis;* where we make it execute another rotation, by which we bring the face under the *pubes.* As we lower the extremity of the instrument, and incline it towards one of the woman's thighs, at the same time that we change the position of the head with respect to the superior *strait*, so we must raise it up and bring it opposite the *pubes*, in the latter period, when we bring the face back again under that bone.

1281. To finish the extraction of the head, as soon as we have reduced it to the position in question with respect to the inferior *strait*, we hold the forceps with the right hand only, placed at the extremity, and apply the left against the *perinæum* of the woman and under the child's neck, which we support with the radial edge of the *index*, so as to make that the centre of motion for the head as it disengages, and not the commissure of the *vulva* or the *fourchette.* We pull towards us with the right hand, raising the handles of the instrument gradually and carrying them alternately towards each of the woman's thighs, till the whole of the face and the *vertex* are disengaged successively from under the *pubes:* for so the head must be delivered in this position, that it may present its smallest diameters to those of the *pelvis;* as I have observed in treating of the mechanism of that natural labour, in which the feet present with the toes upward.

1282. If the head be retained only by the inferior *strait*, at the time when we think it necessary to recur to the forceps, it will be so much the more advantageous, as well with respect to the introduction of the blades of the instrument, as for the extraction of the head itself; and we must conduct ourselves on both points as directed in par. 1279 and 1281. We must not attempt to turn the face towards the *sacrum* in the case which is the subject of those same paragraphs, but with the greatest care and caution.

Method of using the Forceps, when the Head is retained in a transverse Position, after the Exit of the Trunk.

1283. It is generally in this direction that the base of the *cranium* stops at the superior *strait*, when the child comes by the feet, and this accident is to be feared whenever the distance from the *pubes* to the *sacro-vertebral* angle is less than three inches and an half. The position of the head, though transverse, is however not always exactly the same; for the *occiput* sometimes answers to the left side of the *pelvis*, and at other times to the right: this remark is not unimportant with respect to the application of the curved forceps; for their branches ought not to be placed in the same manner in both cases. It is not enough that they be directed on the sides of the head and to a proper height; they must also be so disposed, that their concave edge may be towards the *occiput*, that we may bring it under the *pubes* in the last period.

1284. As it is proper to place the blades of the

forceps on the sides of the head, and as we can never do that more easily than when they can at the same time be introduced towards the sides of the *pelvis*, the accoucheur would spare himself some difficulties, if he could with the hand alone, after having brought down the child's arms, change the position of the head, and reduce it to the first of those which I have described; that is to say, if he could turn the face towards the *sacrum:* but generally, and indeed almost always, he would attempt that removal in vain. We therefore proceed in the following manner.

1285. When the *occiput* answers to the left side of the *pelvis*, we begin by inclining the *trunk* and arms of the child, wrapped up in the same cloth, towards the thigh of that side, where an assistant must support them while we apply the forceps. We first introduce the female branch towards the right side of the *pelvis*, directing the extremity of the blade with the fingers of the left hand, till it passes beyond the child's chin; but a little on the right cheek, that it may not stop under the jaw, nor go into the mouth, or against the nose, in its passage. We continue to slide it up in the same direction, nearly to the height of the child's forehead; afterwards by pushing it with the ends of the fingers which have served to guide it, placed on the posterior or convex edge, it is to be passed over the face and the left temple, to conduct it under the *pubes;* while with the other hand we lower its external extremity, but by insensible degrees, and turn the end of the hook which terminates the handle, directly towards the floor: as I have remarked on account of one of the transverse positions of the crown of the head. See par. 1244.

1286. We then insinuate the other branch di-

rectly before the projection of the *sacrum*, and to the same height as the first, as directed in par. 1245. After that, we unite and fix them, in order to extract the head in the following manner. We first pull downwards as much as possible, till the head has cleared the superior *strait*, observing, as it descends, to incline the extremity of the forceps a little towards the woman's left thigh. But as soon as it is in the cavity of the *pelvis*, we bring the *occiput* under the *pubes*, by raising the end of the instrument, and bringing it opposite to the *symphysis*, to extract the head as in the first position.

1287. We place the forceps in the same manner, in that transverse situation of the base of the *cranium*, in which the hind part of the head answers to the right side of the *pelvis;* but with this difference, that the male branch must be under the *symphysis* of the *pubes*, and the female branch before the *sacrum*.

Of the Use of the Lever.

1288. From what I have said, the use of the lever will not appear so general as that of the forceps, and every practitioner may easily convince himself of it, if he will pay the slightest attention to the mode of acting of those two instruments. The lever ought only to be employed for correcting certain bad positions of the head, and secondarily favouring its exit; but the forceps can extract it whenever the disproportion between the head and the mother's *pelvis* is not too considerable.

1289. The head as it engages in the *pelvis*, sometimes deviates from the course which it ought to

follow to enable it to disengage again from it freely. The posterior part of the *vertex*, or the region of the posterior *fontanelle*, instead of advancing more and more, may recede in proportion as the head descends; so that the upper part of the forehead comes to the centre of the inferior *strait*, as is explained in par. 946, and following. The *occiput* being more or less turned on the child's back, and the chin removed from the breast, so that the head presents its greatest diameter foremost, delivery becomes impossible in many women, without assistance, or at least so difficult, that we cannot be too much on our guard against this bad position, whether to prevent it, or to correct it when we are called later. See par. 952, and following.

1290. The indication, in the first case, consists in supporting the top of the forehead to hinder it from descending; and in the second, in bending the head on the child's breast, either by pushing up the forehead in a proper direction, or by pulling the *occiput* downward. The hand is almost always sufficient to procure this advantageous change; and it is only when that fails that we ought to have recourse to the lever. I must state here that the cases in which the latter becomes necessary, are so rare, that I and my brother have never met with any one where it was indispensable.

1291. It is always on the *occiput*, that we ought to apply this instrument, the curve of which should be proportioned to the convexity of that region; that it may embrace it exactly, and that its extremity may find a rest sufficient to bring it down. We ought to use it as a kind of blunt hook, and not as a common lever. The manner of using it, though always according to the same principles, must nevertheless be a little different in each posi-

tion of the head; because we must have a regard to the natural course which it ought to describe in the various situations, in which it may present, in order to clear the *pelvis* with the fewest obstacles.

Method of using the Lever in that Position of the Vertex in which the Occiput answers to the Pubes of the Mother, and the Face to the Sacrum; and in that where the Occiput is against the latter, and the Face behind the Pubes.

1292. Supposing that it has at first presented the *occiput* behind the *pubes*, and that, as the head engaged, it has turned on the back, if we cannot push up the forehead, or bring down the occipital region with the fingers alone, we must insinuate the lever behind the *symphysis* of the *pubes* till its curve exactly embraces the convexity of the *occiput*. That we may introduce it more certainly and methodically, we must hold it with one hand, so that the extremity which serves for a handle be very low, and we must direct the other end to the place indicated, by means of the fore and middle fingers of the other hand, or one of them only, introduced at the entrance of the *vagina*.* To make the instru-

* In cases similar to the one stated in the text, I have always applied the lever differently from our author. I introduce it, at the inferior part of the *vagina* by holding the handle immediately over the *pubes;* then by gradually depressing it, make the blade sweep over the sides of the head and pass the ear, and thus laterally place its broad extremities on the *vertex;* when placed in this manner the breadth of the instrument will be against one of the legs of the *pubes*, and consequently, as we depress, may with ease be brought under the arch of these bones. W. P. D.

ment penetrate more easily, we must take care to raise a little, but very gradually, the extremity which is without, carrying it a little alternately towards each of the woman's thighs, till the length of that portion which is in sight be nearly parallel to the horizon.

1293. Having slid it up to a convenient height on the head, we take hold of it with one hand, placed over it, near the *pubes*, and the other at its extremity. With the latter, we pull towards us, and a little downwards, while with the former we act as if we wished to depress the head towards the *coccix* of the mother, and carry it backwards; by this means we shall give it a kind of vertical turn, in which the *occiput* will descend, while the chin will rise towards the breast. If we do not succeed by this method in bringing down the *occiput* as much as the circumstance requires, we must, at the same time that we act with the lever on the back of the head, push up the forehead a little, by means of the extremities of some of the fingers of the hand which grasps the middle of the instrument; but so disposed that it may keep the lever firm, and act with some of the fingers on the forehead at the same time. When we have made the head execute this vertical turn, it seldom fails to come along, unless other causes obstruct it: but then we have recourse to the forceps, if circumstances do not permit the woman to deliver herself without help.

1294. The utility of the lever is not less evident in the position in which the forehead answers to the *pubes* and the *occiput* to the *sacrum*, than in the preceding, when the child's chin has quitted the upper part of its breast too soon, and the head has advanced turning a little on the back: but we ought not to use it, except when the fingers alone cannot

rectify the head, that is to say bring down the *occiput*.

1295. We then slide up the instrument between the *occiput* of the child and the *sacrum* of the mother, holding it pretty nearly as we hold the staff for sounding in the common method, or over the belly, with this difference however, that its extremity must be less inclined on the belly, than the end of the staff. To make the instrument penetrate far enough, and go above the *occipital protuberance*, we must gradually bring down the extremity, as far as the external parts of the woman permit it, carrying it alternately from side to side as before directed. Being assured that the lever is well placed on the head, we take hold of the middle part of it underneath, with one hand near the *perinæum*, in order to keep it fixed on the *occiput;* and with the other hand we pull at its extremity. We take care to act at first almost in an horizontal direction, and afterwards rising a little, till the nape, or back of the child's neck begins to appear at the lower part of the *vulva*. We then withdraw the lever, and disengage the face from under the *pubes*, as in a natural labour where it presents in that manner.

Method of using the Lever in all Cases where the Child's Head is placed diagonally or transversely at the inferior strait.

1296. The diagonal positions, with respect to the inferior *strait*, are the consequence of those which we almost always observe at the superior *strait*, and which are the most favourable for the descent of the head. It is not to change those posi-

tions that I propose the lever: the finger is sufficient to make the head take another direction, and bring one of its extremities under the *pubes*, when it does not turn so of itself, which it very rarely fails to do. If the efforts of Nature, and the finger of the accoucheur be insufficient, it would be the forceps we ought to have recourse to, and not the lever. I have already fixed the number of these positions to four, which I shall here briefly recapitulate. In the two first, the *occiput* answers to one of the *foramina ovalia;* these are the most common: in the two others, it is situated opposite one of the *sacro-ischiatic* notches.

1297. When the head has advanced in one or other of these positions turning on the child's back, as I have stated in par. 1277 and following, we must endeavour to push up the forehead and bring down the *occiput*, in the manner indicated in the same paragraphs. If the fingers alone are not sufficient to procure this change, we must have recourse to the lever.

1298. When the *occiput* is placed behind one or other of the *foramina ovalia*, the instrument must be conducted on it nearly as for the position mentioned in par. 1292; except that we direct it a little on one side, instead of insinuating it directly under the *symphysis* of the *pubes;* in order that it may always be applied on the back of the head, which we must bring down properly, and then leave the rest of the delivery to the care of Nature; unless circumstances oblige us to operate immediately; which must then be done with the forceps. But the success of the forceps would be extremely uncertain if we were to use them before we have brought down the *occiput;* as any one may convince himself by recollecting the manner in which that instrument acts, and the relation of the dimensions

of the head thus turned on the back, to those of the inferior *strait.*

1299. When the *occiput* answers to one of the *ischiatic sinuses*, we must insinuate the lever in that direction; keeping the end which is without, very high at first, and more or less inclined towards the groin of the opposite side. The rest of the operation to be conducted as when the *occiput* answers directly to the *sacrum*, till we have brought it down, and reduced it to a proper position.

1300. The lever may be useful, not only in all the cases stated in this chapter, but also in those in which the face presents, as I have already observed. In all of them, in case of necessity, one of the branches of the forceps may be substituted for it, though perhaps with somewhat less advantage, and its application requires more care and attention.

Labours which cannot be terminated without the Application of some cutting Instrument to the Body of the Child.

1301. The mother and child do not always derive equal advantages from the science of midwifery; because there are circumstances in which we cannot secure the life of the one, but by more or less exposing that of the other. Although these circumstances are much more rare at present, than in the last age, or even at the commencement of the present, when crotchets and other instruments for opening the *cranium* were frequently employed; we still however meet with some in which we are obliged to apply these instruments to the child; as likewise with others that oblige us to perform

painful and even dangerous operations on the parts of the mother, to rescue her, as well as her child, from certain death.

1302. Crotchets and *perce-cranes* are not the only cutting instruments which we are obliged to apply to the child in its mother's womb; the history, the trocar, or the scissars, are sometimes indicated preferably. The child is almost always living when these latter merit the preference; and if it perishes after their application, it is not so much an effect of the division which they have made, as of the disease which required them. It is not the same with crotchets, and other instruments of that kind; nothing but the death of the child can authorize the use of them, whatever obstacles may obstruct delivery; because they almost always kill. Though we have sometimes extracted children alive by their means, we have generally had the mortification to see them expire, a few minutes afterwards, in consequence of their wounds.

1303. The causes which ought to determine us to use these instruments, are generally, a deformity of the *pelvis* of the mother, or of the child, whether of the head or *trunk;* a dropsy of the *cranium*, breast or *abdomen*, &c. All these causes shall be stated in the sequel, as I treat of the operations they require; but before all, it seems to me proper to explain the signs which may enable us to judge, whether the child contained in the womb be living or dead; because it would not be less contrary to the rules of the art and to every principle of humanity, to mutilate a living child in the womb of its mother, with a view of sparing her the pain and danger of the Cesarean operation, than to perform it, to give an exit to a child already deprived of life, which might have been ex-

tracted at the usual passage, after being dismembered. I shall neglect nothing which may enable young accoucheurs to steer clear of those disagreeable rocks: if I cannot place them in perfect security, because of the uncertainty which sometimes attends the signs I am going to lay down, I shall, at least, render them exceedingly circumspect in the use, already become too familiar, of this kind of instruments.

Signs by which we usually judge whether the Child be living or dead.

1304. The regular increase of the woman's belly, her enjoying a good state of health, the movements which she feels within her after the fourth month of pregnancy, or which the accoucheur distinguishes by applying his hand to the part where they are felt, are before the time of labour, the signs by which we commonly judge that the child is living. But how often have we been deceived on this subject!

1305. These signs in fact will not appear decisive, if we consider that the volume of the woman's belly sometimes increases after the death of the child; that many women feel internal movements like those of a child, although they are not pregnant; that others, who are really so, scarcely distinguish any, notwithstanding the child be in perfect health; lastly, that some have been delivered of a child, dead and putrefied, a day, nay even the instant after they thought they felt it move.*

1306. When the child is living, other signs make

* I advance nothing on this subject which is not the result of observation.

it known in the course of labour. Many accoucheurs think the pains are brisker and more constant, and that the waters of the *amnion* are clear and limpid, but we cannot establish a judgment on such symptoms; and the following appear much more certain. The skin of the *cranium* is tight, it enjoys the elasticity proper to the *tegaments*, and there forms a tumour or swelling in it more or less considerable, whenever the head advances with difficulty. We distinguish the pulsation of the heart, and of the arteries of the cord, when the fingers can reach them, as well as the motions of the tongue and of the lower jaw, when we introduce it into the mouth: but unfortunately we cannot always carry the finger so far in that disagreeable circumstance, in which the art leaves us no other resources but the Cesarean operation, or the section of the child *in utero*. We must then refer to the commemorative signs, and to those which may be deduced from the part which the child presents at the orifice of the *uterus*. The least equivocal of all, is the tumefaction which arises on the head, during the efforts of labour, or that which arises on the part that presents, or is pressed against the entrance of the *pelvis*.

1307. I have observed in par. 350, that the anterior *fontanelle* has no pulsation before birth; and I shall remark here, 1. that the pulsation of the arteries of the finger which we use in these researches, is often mistaken for that of the arteries of the part of the child subjected to the touch: 2. that the irregularity and slowness of the labour pains are most commonly independent of the life or death of the child; as well as the colour and odour of the waters of the *amnion*. I have frequently found the latter very clear, and without any extraordinary odour, though the child was dead; and at other times

turbid, greenish or grayish, and of an insupportable *fetor*, when the child has been living and healthy.

1308. The absence of the apparent signs of life in the child *in utero*, does not always characterize its death in a manner sufficiently evident, to secure us from falling into error on this subject; and nothing can more clearly convince us of this truth, than the difficulty, and even impossibility which we sometimes find, to determine whether a child, which is entirely submitted to our senses, which we can see and touch, be living or dead. I have known some living, who at first had been thought dead, and had even been abandoned as such, after a long continuance of apparently fruitless endeavours to revive them. If it is so difficult then to pronounce on the state of the child, with what prudence ought we to do it, when we can only touch, as I may say, a single point of its surface, as almost always happens when the *pelvis* is so much deformed as to require the Cesarean operation, or the section of the child in the womb!

1309. The child's death is not always the effect of one and the same cause; sometimes that accident is the consequence of the disorders of the mother, and at other times of those of the child, or of an external cause, as of a blow, a fall, &c. Among the former, I know none more dangerous for the child, than convulsions and a plethora.

1310 The commemorative signs, at most, can only be of use in the case where the child perishes some time before the usual epoch of its birth; we can derive no advantage from them when its death happens during the course of labour.

1311. When the child dies during pregnancy, if the mother retains it some time, instead of the movements she had been used to feel, she soon finds

a troublesome rolling in the *uterus*, and a sensation of heaviness in the side she lies on. From the third to the fourth day, the belly commonly swells, and becomes painful, and then grows less; the face soon after becomes pale, the eyes sink in, and the eyelids are surrounded by a blackish, livid or lead coloured circle; she has a bad taste in her mouth, yawns frequently, has pains in her head, singing in the ears, nausea and vomiting, *syncopes* and spontaneous lassitudes; her belly shrinks, and she is often consumed by a slow continual fever.*

1312. These effects seldom fail to manifest themselves when the woman retains the dead body of the child some time; but I have seen them occur in the same order, after a fall which a woman had in the sixth month of pregnancy, though the child was not dead. The woman remained a fortnight in the same state, without distinguishing the least motion that could be attributed to the organs of the child; but she afterwards felt some slight ones, which grew stronger by degrees, and she was not delivered till after two months; the child was alive, but very weak and languishing; it however recovered, and became as strong as usual.

1313. Another woman almost at full time, in her second pregnancy, being awaked by a frightful dream, and thinking she still saw the subject of it, leaped out of bed to defend herself, and call for help. Being come to herself, she only complained

* When the child dies any time before its delivery, that is, five or six days at least previously, we almost always find an attempt, (and frequently a successful one) in the breasts to form milk; the *uterus* after the death of the child appears to be, with respect to the breasts, as if the child had been expelled. I therefore consider this almost a decisive sign, and one of great importance sometimes, more especially in threatening abortion. W. P. D

of the extraordinary motions of the child, which from the next day gave no other indications of its presence, than the troublesome rolling mentioned in par. 1311. The symptoms stated in the same paragraph afterwards appeared, and the woman, overcome by those accidents, as well as by the alarming prospect of seeing her child born dead, was delivered the tenth day; not as she feared, but of a strong healthy child weighing nine pounds at least.

1314. When the child dies some days before its expulsion, the waters of the *amnion* are most commonly thick and turbid, as if mixed with *meconium;* and have a fetid and cadaverous smell. The bones of the cranium are loose, the skin which covers them is very slack, and it is sometimes formed into a bag under the crown of the head, which is found full of a glairy reddish water.

1315. The concurrence of all these signs leaves no doubt of the child's death; but as they can only be the effect of its putrefaction, they do not always exist at the time of labour; either because it is but lately dead, or because it may remain in the waters of the *amnion* without putrefying.* We should therefore sometimes endanger the life of the mother, if we were to wait for the union of all these signs before we determined the mode of proceeding. The child's death never causing such a sensible alteration in the natural order of the circumstances which have preceded it, as to make it known immediately, prudence must guide us in the choice of operations which may effect its life, or that of the mother.

* I have received children who had remained sound several months after their death. Their skins were white and shrivelled, as if withered. They had died long before the natural period of labour.

1316. I have already remarked that there is a tumor formed in the *tegumens* of the *cranium*, when the head of a living child is strongly pressed against the margin of the *pelvis*, or wedged in the superior *strait*,† and that that effect cannot take place, when the child's death has preceded the opening of the membranes, even a single instant. We also know that it softens and becomes flaccid, if the child, though alive at the beginning of labour, should die in the course of it. But the absence of that tumor does not always indicate its death with certainty, as some have believed and published, any more than the flaccidity which succeeds to the elasticity which the tumor first had, when it takes place, though the head remained locked, as some have pretended. "When the head threatens to be locked," says the celebrated *Levret*, "a tumor is formed on the part which presents, which continually augments in volume and solidity, till it is unwedged, or the child dies: in the latter case, the tumor not only augments no farther, but it grows softer." He adds farther on: "If the tumor ceases to augment before the head is unwedged, it is a certain sign of the child's death."

1317. If from that circumstance alone, we were to determine to dismember the child, or open the *cranium*, we should sometimes have to reproach ourselves with having sacrificed the living. The tumor in question may soften from a cause very foreign to the death of the child, and without its ceasing to live. The flaccidity which succeeds to the elasticity it possessed at first, is sometimes the effect of an extravasation of fluids, which before were merely *engorged*. Another species of sanguine

† See par. 1161.

tumor by extravasation, in consequence of the rupture of some of the veins,* frequently succeeds those elastic tumors. In labours which the deformity of the *pelvis* renders very difficult and tedious, touching inconsiderately practised, may favour the formation of both these tumors; and especially soften the former, without forming any considerable collection, but only an extravasation in the *subcutaneous* cellular membrane.

1318. The discharge of the *meconium*, the irregularity of the pains, and their cessation, are not more certain signs of the child's death, than the *fetor* of the humors which drain from the *vagina;* or the separation of the *epidermis* from the part which presents to the touch.‡ A coldness in the umbili-

* I have three times met with this sort of tumors, and each time was in a first labour. At first, the *teguments* of the *cranium* were swelled, and the tumor was evidently elastic. It softened all at once, and augmented so far, in one of the children, that it equalled the half of a duck's egg cut across. The three children in question were born living; and had it not been for those extravasations of blood on the outside of the *cranium*, they would probably have been victims, like many others, to an *engorgement*, or rupture of the vessels of the brain. I shall publish my thoughts on this subject at some future time.†

† I can add my testimony to what our author here advances; and think it proper also to put the young practitioner on his guard against mistaking this tumor for the unruptured membranes: a mistake I have twice seen committed, to the serious injury of the child; the *teguments* being scratched through with a view to force the waters. W. P. D.

‡ Notwithstanding repeated observations which demonstrate the uncertainty of these signs, by presenting examples, as I may say, of so many victims to the use of crotchets, they are still frequently made use of. The following fact will perhaps inspire more diffidence in those symptoms, because there is no case, where they can be united in greater number, or where we should appear better founded in recurring to the

cal cord, its putrefaction, and the want of pulsation in its arteries are more certain signs of it; but we cannot judge of them, except when that part is without, or when it forms a loop across the orifice of the *uterus*.

1319. As these symptoms considered separately, present us but equivocal signs of the child's death, the concurrence of all, or the greater part of them at

crotchets. Being furnished with the forceps, which I had just successfully used in delivering Madame D***, the 15th of August, 1782, about the middle of the night, a poor woman in the neighbourhood desired my assistance; but from the bad state in which I found her, and the certainty I thought there was of the child's death, I determined to prefer the crotchets, but I deferred their application a few hours; as well because I had them not with me, as because the case presented more pressing indications than that of terminating the delivery. The poor woman had been two whole days in labour, the pains were now scarcely perceptible, the belly was exceedingly swelled, tense and painful; the air of an insupportable *fetor* was every instant discharged with noise from the *uterus;* and the fluids which drained from it were not less fetid. The child's head resting on the superior *strait*, appeared to be not at all advanced, and the small diameter of the *strait* was but three inches or thereabouts. The scalp was loose, pendant, and in a manner rotten; the *cuticle*, and the hair came away easily and stuck to the finger. No motion of the child had been felt for more than twenty-four hours. The woman's pulse was weak, but very quick; her tongue, lips, and gums were black and parched: and every thing exhaled a cadaverous stench. Judging that the child was dead, I determined to extract it with the crotchet, and the instrument was already in my hand, when a fortunate presentiment led me to substitute the forceps, which I applied in the manner directed in par. 1244. and following; I extracted a child living and healthy, except a gangrenous slough which it had on the crown of the head, but which went no deeper than the skin, and cast off immediately. The mother, already very ill, remained so a long time, and had scarcely begun to mend a month after. M. *de Beauchesne*, M. D. was a witness of this labour, and generously attended the woman in the sequel.

least, ought alone to authorize us to make use of cutting instruments, of the nature of crotchets and *perce-cranes:* and even then we ought to prefer the forceps, when we can use them.

Of the Application of Crotchets, and other Instruments of that Kind, to the Head.

1321. The use of crotchets ought then to be very limited: though these instruments are equally capable of penetrating all parts of the child, we ought only to apply them on the head, or at most on the upper part of the *trunk*, when the head has been torn off in the passage.

1322. The causes which ought to engage us to employ the crotchets exclusively, are all those which require us to terminate the delivery without delay, at a time when the head of a dead child occupies the lower part of the *pelvis;* or when we cannot, without danger to the mother, push it up again, and search for the feet though much less advanced; as when the waters have been long drained off, or when the *uterus* is strongly contracted, tense, and painful; lastly, when it is so softened by putrefaction, that the forceps cannot get a sufficient hold to bring it along.

1323. It is on the *occiput* that we ought to fix the crotchet when the head comes first; and on the upper jaw, or the forehead, when we are obliged to use it in preternatural labours, after the *trunk* is delivered. By acting in this manner, we make the head descend with one of its extremities foremost, and it presents only its smallest diameters in every part of its passage. We should likewise consider

the particular direction which it ought to take in each position in which it may present, that it may traverse the *pelvis* with the least possible difficulty.

1324. We should take great care in every part of the operation to do no injury to the woman by the point of the crotchets, by guarding it with the thumb placed under where it is fixed. The accoucheur must also be on his guard not to injure himself.

1325. When this instrument is employed to evacuate the contents of the head, its size must exceed that of the *pelvis*, or the straits it has to pass through. This may arise from defect of size in the *pelvis*, or excess in the head.

1326. It is very rare that the diameters of the head surpass the natural dimensions of the *pelvis*, except in the case of an *hydrocephalus;* but it often happens that the dimensions of a deformed *pelvis* are inferior to the usual dimensions of the head; which constitutes two very different states, though presenting nearly the same indications with respect to delivery.

1327. All people of the profession know that *hydrocephalus* is the name given to a collection of water formed within the *cranium;* and sometimes also to a species of *anasarca* which is confined to the surface of the head, though it be not a true dropsy. I shall speak only of the first species, and that without any regard to the distinctions which authors have made in it, that is to say, without determining the true seat of the extravasation; only considering this disease relatively to the obstruction it may give to delivery.

1328. All children affected with *hydrocephalus* are not incapable of being born naturally; the labour is a little more contracted and severe. It is but

when the head is much augmented, that it requires assistance. This disease is easily known, by the thinness and softness of the bones of the *cranium*, and by the separation of their edges at the *sutures*. The head hardens during pain by the protrusion of its contents against the external teguments. As this disease is extremly dangerous to the child, no one will be rash enough to propose the Cesarean operation for its delivery. It is much better to discharge the water by puncture. This may be done alone on the *suture* by a pair of scissars, *trocar*, &c.

1329. An hydrocephalic child does not always present the head, and unless it be found in the neighbourhood of the orifice, sometimes we are obliged to turn it, and bring it by the feet. In that case, we do not discover the disease till after the exit of the *trunk*, or, at least, till the volume of the head, augmented by the water, obstructs the delivery: for things go on as usual, till it arrive at the superior *strait*. When it cannot clear that, it is proper to open it, as in the former case: but we then do it by plunging the instrument towards the *fontanelles* which are at the bottom of the *lambdoidal suture*, or even in the occipatal hole, behind the first *cervical vertebra*.

1330. A simple puncture of the *cranium*, in the case of an *hydrocephalus*, is sufficient to evacuate the waters, and reduce the head to the size proper for its exit: but it is not so when the disproportion, which obstructs it, depends on a deformity of the *pelvis*. Besides that a similiar puncture could not prepare an exit for the brain, a solid and well constituted head cannot shrink and contract like one that is hydrocephalic. Though the indication, arising from a defect in the capacity of the *pelvis*, is the same as in that where the accidental size of the

child's head renders delivery impossible, though in both cases that indication consists in diminishing the bigness of the head, yet we must set about it very differently. Every kind of instrument, provided it be pointed and sharp, may serve for opening the *cranium* in case of an *hydrocephalus*, and a little dexterity is necessary for its application: but in the other case, a great number have been invented, either for dividing the head, or for extracting it: and their application requires a great deal of care. The best is the one proposed by *Smellie*, namely his scissars, for opening the head, and the crotchet the best for extracting it.

1331. We ought always, if possible, to open the *cranium* in the *sutures*, and especially in the *sagittal*. A crucial, or angular incision, would more certainly favour the contraction of the bony pieces which form that cavity, than a simple incision, and would consequently be preferable. The head is never more favourably disposed for this operation, than when it presents the *vertex*, and the operation is so much the easier; as it is farther advanced, and more wedged between the bones of the *pelvis*.

1332. The instrument is to be directed by the help of some of the fingers, which have been previously passed into the *vagina;* and must be plunged into the *cranium;* we must enlarge the opening by extending the handles without, and giving the whole instrument a rotatory motion. The *cranium* being sufficiently open, we withdraw the instrument and introduce the fingers to evacuate the brain.* We afterwards bring the head along, either with the fingers bent within, or a crotchet applied on the *occiput*.

* Or what is much better the crotchet itself.

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1333. If we have attempted to extract a child by the feet, in a case where the *pelvis* is not large enough for the passage of the head, we must open the *cranium* with the same care. But as we cannot then carry the instrument into the *sagittal suture*, we must cut into the middle of the forehead, and on one of the branches of the *coronal suture*, or in the direction of the *lambdoidal*, to make an angular section. By means of that section we may easily bring down the *occiput*, or one side of the *os frontis*, or force them inwards, and give an easy exit to the brain. By proceeding thus, we avoid much difficulty, and often prevent the detachment of the child's head.

1334. Whenever we have emptied the *cranium*, it is proper to inject warm water into the *uterus*, after the delivery is completed; to wash away the remains of the *brain* which might be retained in that *viscus*, or in the *vagina:* but it is not necessary to repeat it.

Of the Retention of the Child's Head after the Trunk is torn from it, and the Method of extracting it.

1335. It sometimes happens in preternatural labours, when the child is brought by the feet, that the *trunk* is torn away from the head, and the latter left behind. Though a skilful man may always avoid this disagreeable accident, yet he cannot flatter himself that he shall never be called when others have exerted such manœuvres as to cause that separation.

1336. We may avoid tearing away the child's *trunk*, either by directing the head properly, or by applying the forceps, or by opening the *cranium* to lessen its bulk; for that accident is always a consequence of the omission of one or more of those three things.

1337. A deformity of the *pelvis* is not so often the remote cause of this accident as is supposed. The child's head may stop at either of the *straits*, though large enough to give it a passage, if well directed. Experience has supported this truth a thousand times; since in many cases, changing the position of the head has been sufficient to enable the woman to expel it, or to be delivered of it without any other assistance than that of the hand. The head, though properly directed, is not always secure from being torn off, if the accoucheur knows no other rules to bring it along, than those of pulling at the *trunk*. Sometimes the dimensions of the head so surpass those of the *pelvis*, that it cannot be brought along in any way, especially if the bones are already so solid, and the *sutures* so close, that it cannot lessen, and mould itself in some degree to the form of the canal.

1338. An excessive putrefaction of the child, is also one of the predisposing causes of the separation of the head; but in all cases it is the efforts which the accoucheur exerts inconsiderately on the *trunk* without, which are the immediate or efficient cause of it.

1339. Authors are not all agreed on the mode of proceeding in these cases. Some are for abandoning it entirely to the efforts of Nature; while others insist we cannot deliver it too soon—both perhaps are wrong, in the extreme. Nature ought not to be trusted where the head is jambed or badly situated with respect to the *pelvis*, as her efforts would be unavailing; and the advantage which some have supposed might be derived from putrefaction coming on and separating the bones of the *cranium*, must be visionary, since the woman must inevitably suffer, whenever this should take place.

1340. Nature should be only trusted then where the

head would pass readily through the *pelvis;* the certainty of this can only be determined by passing the hand into the *uterus*, unless it be a labour of seven or eight months; and if we must pass our hand into the *uterus*, why not free it from this foreign body? This might more especially be done, as Nature finds more difficulty *cæteris paribus* in delivering a detached, than a connected head, owing to the uncertain situation it takes at the entrance of the *pelvis;* therefore, as we cannot dispense but very rarely with introducing the hand into the *uterus*, either to ascertain the size, or give a proper direction to the head, it seems a duty to spare the woman all fruitless efforts by delivering it.

1341. When its volume does not exceed the extent of the openings of the *pelvis*, its separation from the *trunk* having proceeded from no other cause than the ill-directed efforts exerted on the latter, the hand will suffice to extract it. We first examine if the greatest length of the *cranium* be placed according to the greatest diameter of the superior *strait*, and direct it so, if it be not. We afterwards hook it by means of two fingers insinuated into the mouth, and the thumb placed under the chin, or on the posterior part of the neck, of which there is almost always a portion left. We pull towards us and according to the axis of the *pelvis*, till the head has cleared the superior *strait*, while the woman pushes strongly downwards. When it is descended into the cavity of the *pelvis*, we turn the face underneath, and continue to pull at the lower jaw, raising the hand a little, in order to bring the chin to the *vulva*, and disengage it entirely. If the lower jaw has been torn off, we must use a crotchet, and fix it in the top of the forehead. See par. 1323.

1342. If Nature still finds resources in herself; if

she can, strictly speaking, deliver herself without help in the case we have just stated, it is not so when a considerable disproportion exists between the dimensions of the head and those of the *pelvis*. The woman has then, in fact, no certain resources but in the assistance of art, and the application of instruments. We should expose her to an almost inevitable death, if we were to commit the expulsion of the head to Nature; for she could not deliver herself of it, but by the effect of putrefaction, and that is a fruitful source of accidents. This case is therefore evidently within the province of art; it presents the same indications as if the head were still attached to the *trunk;* but it is a little more difficult to accomplish them.

1343. The accoucheur may accomplish these views perfectly, with the hand which he introduces into the *uterus* to direct the instruments destined to open the *cranium*.* He must begin by bringing the crown of the head to the superior *strait*, in a transverse situation, and fix it so, by bending the fingers over the base of the *cranium*. He must then conduct the instrument, which he holds with the other hand, along the thumb, and direct its point into the course of the *suture* it is designed to penetrate, to open the *cranium*, as directed in par. 1332. After having withdrawn the instrument, we may pass several fingers into the *cranium* to force out the brain, and lessen the bulk of the bony case, in order to bring it along with the same hand; or, if that fail, by means of a crotchet placed on the face or on the *occiput*.

1344. Though this operation is absolutely necessary when the volume of the head is such that its dimensions far surpass those of the *pelvis*, and though

* I conceive no instrument so well calculated to fulfil this intention as Smellie's scissars. W. P. D.

in all cases it is better to extract the head, than commit its expulsion to Nature, we are often obliged to temporize, and first attend to the more pressing indications presented by the inflammatory state of the *uterus*, of its neck, &c. &c.

Of the Beheading the Child, or the Separation of the Head from the Trunk; and of several other Cases which require the Application of cutting Instruments to the Trunk itself.

1345. As the *trunk* may be separated from the head in preternatural labours where the child is brought by the feet, so also where the head presents first, it may be separated from the *trunk*, and the latter be left in the womb of the woman. A neglect of some of the fundamental principles of the art, a putrefaction of the child; and a preternatural bigness of the *trunk*, whether it arises from a monstrous conformation, or from an extravasation of fluid in one of its cavities, are so many predisposing causes of this accident.

1346. It is always much easier to extract the *trunk*, after the head has been torn from it, than to deliver the woman of the *head*. To change the direction of the shoulders, is sometimes sufficient to enable us to bring it along easily, either with fillets or blunt hooks placed in the armpits, or with common crotchets fixed in the top of the breast or back. M. *Levret* seems to have proposed his crotchet with a sheath at first for this case only. When the shoulders are still above the superior *strait*, we may bring down the child's arms, and apply fillets on the wrists, with a view of pulling with one hand to extract the *trunk*, while with

the other introduced into the *vagina* we keep the portion of the neck, if any remain, in the direction of those same extremities. Sometimes, instead of bringing down the arms, it is better to turn the *trunk* and extract it by the feet.

1347. When the breast or the *abdomen* contains water enough to render these efforts fruitless, we must evacuate the fluid, by opening the cavity which contains it, either with a crotchet or any other proper instrument. But when the monstrous conformation of the *trunk* prevents its exit, it must be divided as will be stated in the following paragraphs.

1348. A dropsy of the breast is excessively rare in the *fœtus*, as well as that of the *abdomen* in the degree that would render delivery impossible without help; and it scarcely ever disturbs the natural order of that function.

1349. It is extremely difficult to be assured of the existence of this disease when the child presents the head. If we have a right to presume that it is dropsical, when that part, though of a moderate size, ceases to advance, notwithstanding violent efforts on the part of the woman, yet we cannot discover it certainly but by introducing the hand as far as the seat of the extravasation; which is not easy, because the head which then fills the passage, strongly opposes those researches. But it is not so when the child presents the feet; as they are scarcely without before those difficulties manifest themselves, we may easily insinuate the hand along the thighs to judge of the nature of the obstacle. A dropsy may be known by the size, by the tension of the belly, and especially by the fluctuation.

1350. Being perfectly discovered, the indication relative to delivery is not difficult to determine: the water must be evacuated, by opening the belly or

the breast. Very long scissars, the point of a crotchet, a common knife, and especially that which some have proposed for opening the *cranium* are equally proper to accomplish the views of the accoucheur.

1351. A very small incision will suffice; and we ought not to make a large one but when we are certain of the child's death. The part in which it is made is of no importance in the latter case, and it is only when the child is alive that we ought to prefer one place to another. After opening the belly we place two fingers separated at the sides of the incision, to press it a little and favour the discharge of the water, which without that precaution might still find some obstruction to its exit; because the neigbouring parts of the woman, against which the surface of the child immediately applies, may stop the opening.

1352. The misconformations which a child may present at birth are very numerous: but they do not all equally merit the name of monstruosities, nor give the same obstruction to delivery. Those which consist in the want of certain essential parts, as the head or the extremities, seem more likely to favour it, than render it more difficult: but it is not so in those extraordinary conformations where several heads are placed on one *trunk*, two *trunks* attached to the same head; or in which twins are united, either by the *tegumens* only, or by other parts, so as to form but one whole; as is frequently observed.

1353. The examples of some deliveries which have been performed by the efforts of Nature alone, notwithstanding so strange and monstrous a conformation,* far from throwing any light on the rules to

* In 1763, a woman of the town of *Amiens* was delivered very naturally, and without any other assistance than that of a neighbouring midwife, of a living child who had two heads, two *trunks*, and six or seven extremities as well superior as

be observed in such cases, only make us more uncertain what method to determine on: these are cases where the ignorant seem to triumph, while the man of skill dares propose nothing. Though experience teaches us that there have been women so happily constituted as to deliver themselves without help, of a child having two heads or two trunks, it also teaches us that the assistance of art sometimes becomes necessary.*

1354. We cannot discover these sorts of monstruosities but by carrying the hand into the *uterus;* and even then it must be difficult to distinguish exactly what they are, on account of the manner in which the child is folded up, and the confusion in which all its limbs present to the touch.

1355. It is impossible for the two heads of a child thus formed to engage at the same time, when they present first; whether the delivery be performed without assistance or not; one of them always turns back on the *trunk*, while the other descends. The same

inferior. Each head was nearly of the natural size, and the body of the second child appeared seated on the left arm of the first. I shall observe in favour of the opinion of those who attribute these effects to the force of the mother's imagination, that this woman had passed almost the whole time of her pregnancy at the feet of an image of the virgin, situated in one of the churchyards of the town; sacrificing all her domestic affairs to the love she had conceived for this statue, when she became pregnant. Three other children of a similar conformation, were born with as little difficulty at the time I was employed about the first edition of this work; one at *Paris;* another in a neighbouring village; and the third in *Bretagne*.

* At the time when the disputes concerning the section of the *pubes* were at the greatest height, some public papers mentioned that the Cesarean operation had been recently performed, and with success, by *M. Zimmerman*, surgeon major of the regiment of *Sterburi*, to deliver the countess of *Chercy* of a child which had three heads. But I cannot certify the truth of the fact.

thing happens with respect to the inferior extremities when the child is extracted by the feet, unless we take care to bring them all down: but in this latter circumstance, we cannot hinder the two heads from presenting and engaging together; which renders their exit extremely difficult. In all cases, the mother's *pelvis* must be excessively large, for her to be delivered by the natural passage without mutilating the child.

1356. It would be very useful if we could early distinguish the cases of this kind where Nature could dispense with the assistance of art, from those where that assistance is indispensable; that we might not expose her to fruitless efforts in the latter, and leave her at liberty in the former. But it is not less difficult then to explore the bounds of her power, than to fix on the best method to be employed when she is unequal to the task.

1357. When we reflect on the difficulty of dismembering in the womb a child so misformed and so monstrous as those in question, independently of the danger which may result from it to the woman herself, we find it hard to decide whether such a procedure be preferable to the Cesarean operation. Or is it allowable to take that method, when the child is living? Though monstrously formed, has it no right to life, and do the laws authorize us to destroy it, to save the mother from an operation which does not appear to us, either more painful, or more dangerous for her, than that by which it is pretended her life might be secured? If we knew the history of all the women who have undergone the Cesarean operation, and of those whose children have been dismembered with crotchets or other instruments of that kind, perhaps we should find, that in an equal number, death had spared fewer of the latter than of the former. But

every one has related his successes, and seems to have thrown a veil over the rest.

1358. Yet if we could have any certainty of the death of a child thus formed, and if we could clearly perceive the possibility of separating the superfluous parts without injuring the mother, we ought to prefer that resource to the Cesarean operation. We ought also to have recourse to it, if twins, though living, were only joined by a portion of their *teguments;* except it were by the tops of their heads only, as we see in the tables of *Ambrose Parè;* because they might then be extracted without separating them, and the operation be performed with more certainty after their birth.

1359. We must reckon among the monstruosities of the child, relative to delivery, large tumors which it is sometimes born with. I have seen one whose dimensions far surpassed those of the head of a *fœtus* at full time; being five inches long, and four thick in every direction. It was placed at the bottom of the *trunk*, and hung between the thighs. Its nature was fungous and *steatomatose:* its surface was furnished with a great number of veins, and presented the same appearance as the surface of the brain covered with the *pia mater*, so thin and transparent was the skin become. The head passed through the *pelvis* without much difficulty, but I found a great deal in extracting the *trunk*, and, notwithstanding my utmost care, the child died in the passage. Having no longer any concern for the child, I proportioned my efforts to the resistance I met with, the *teguments* of the tumor burst, and it lengthened and accommodated itself to the form of the *pelvis.**

* We meet with a pretty similar example in the work of *Peu.* Since the time when I observed that tumor, I have met

Of the vitious Conformation of the Soft Parts of the Woman, which constitute what is commonly called the Passage, considered as a cause of laborious Labour.

1360. A VITIOUS conformation of the soft parts of the woman may be from birth, or accidental. In the first case, the defect may consist in an agglutination of the *labia*, in a narrowness of the entrance of the *vagina*, on account of the form and hardness of the *hymen* in the small size of that canal, or the membranous intersections which are sometimes found in it; in a partial closure of the neck of the *uterus;* lastly, in the privation of all the external parts which form the *vulva*. The accidental misconformation of all these parts may be an effect of the presence of a tumor, or the consequence of ulcerations which may have caused preternatural adhesions.

1361. Among the tumors which may arise in the parts of the woman, some are inflammatory and are formed suddenly; others are of an indolent nature and increase slowly: but all, according to their volume

with two others nearly of the same size, and also situated at the bottom of the *trunk*, but they contained only water. *M. Piet* presented the Academy of Surgery, in 1787, with an example of one much larger still, which he was obliged to open, to finish the extraction of the child: he estimated the diameter at a foot. It was formed in two lobes at the lower part, one of which was smaller than the other. The *cyst*, covered with the *tegument*s, distended and dried at the time I had a sketch taken of it, presented the following dimensions. Its breadth, from one thigh to the other, and above its division into two lobes, was nine inches and a half, and its height seven inches and a half; the breadth of the great lobe, and its thickness from before backward, five inches eight lines; the breadth and thickness of the small lobe four inches and a half.

and situation, may give more or less obstruction to the exit of the child.

1362. It is easy to discover the nature of the greater part of these tumors; but there are some which may be confounded with others to which it would be dangerous to apply a cutting instrument; as in those *entero-vaginal* hernias described by *Garangeot*,* and the hernias of the bladder mentioned by several authors. We may easily distinguish an abscess which is the consequence of an inflammatory tumor, from an indolent deposition; because the previous symptoms are not the same: but we often cannot discover the nature of the latter till we have opened it. It is this species which we sometimes find difficult to distinguish from the hernias I have mentioned, and more difficult still from certain sanguine tumors seated in the cellular tissue of the *vagina:* which ought to render us extremely circumspect in opening them, when they obstruct delivery. Though certain that they are humoral, if their nature remains doubtful, we ought to make but a very small incision; but we may act with less reserve in opening tumors that have been inflammatory.

1363. An *œdema* is the most usual of all the tumors which may arise in the parts of the woman; and the cellular substance within the *pelvis* is not always exempt from that *infiltration* which sometimes extends even into the substance of the *symphysis*. A moderate *infiltration*, far from opposing delivery, rather favours it, by weakening the tone of the parts which form the passage, and moistening them; but a more considerable *infiltration* may obstruct it, or render it very difficult: as we see when the *labia* are very thick and tense; when the anterior part of the *vagina* forms

* See the memoirs of the Royal Academy of Surgery, t. i.

a large tumor without, which contracts the entrance of that canal; lastly, when the infiltrated fluid spreads far and wide into the whole of the cellular substance within the *pelvis*. In all these cases, we are obliged to make scarifications in the inside of the bottom of the *labia*, to disgorge the parts and render the passage accessible to the child.*

1364. Varicous tumors are the most frequently met with after the *œdema;* but they are almost always very small and very numerous. They are found particularly in the *labia*, and in the internal parts of the *vagina*, and I have met with them even in the neck of the *uterus*. The veins which wind through the cellular substance of the *vagina* and of the neighbouring parts, may also dilate and become varicous. Though these tumors seldom acquire a sufficient volume to oppose the exit of the child, their bursting may at least give some obstruction to it, by causing an extravasation of blood in the cellular tissue of the surrounding parts, as appears by the following case. A woman whose external parts of generation were affected with varicous tumors at the time of labour, was scarcely delivered before she was again attacked with pains, which made her imagine she had another child, and obliged her to send for *M. Solayres*, from whose theatre she had just retired. That accoucheur, suspecting that the retention of a clot of blood might be the cause of those pains, and endeavouring to certify himself of it by the touch, found the passage so stopped that he could not introduce his finger into it.

* I have seen two cases when the swellings from this cause were so extensive as to entirely close the *vagina*, and prevent the exit of the child. The fluid was evacuated by numerous punctures in the *labia*, and most depending parts, and the child then readily passed:—no ill symptoms succeeded the delivery. W. P. D.

It not being easy to discover the nature of the tumor which occupied all these parts, by the touch, he uncovered the woman, and saw that the *labia* were turned from within outwards, the *nymphæ* in a manner effaced, and the lower part of the *vagina* inverted; that those parts were considerably swelled, tense, and of a colour which denoted a sanguine infiltration. Surprised at such a phenomenon, of which he had never seen an example, *M. Solayres* sent for *M. Levret*, who could not come, but sent his senior pupil. They prescribed emollient and discutient lotions and cataplasms, waiting till other indications should present. Several days afterwards the *lochia* began to appear, the *vagina* became accessible to the finger, the pains abated a little, and the tumor softened and shrunk. The woman discharged a great deal of putrid bloody humor, which was looked upon to be produced, as much from the disgorgement of the cellular substance of the tumor and of the neighbouring parts, as from the *lochia* retained in the *uterus*. *Solayres* attributed the tumor to the bursting of one of the varicous veins already mentioned; and the disgorgement of it, to an opening which Nature had made towards the farther end of the *vagina*, though he could not discover it by the touch.*

1365. Admitting these conjectures, the first of

* A case similar to this occurred to a midwife in this city, to whom it gave great alarm. I was sent for, and before my arrival, the internal face of the right *labium* had given way, and discharged a considerable quantity of blood; the *labium* before its bursting was said to be nearly as large as a child's head; it became frequently distended afterwards, and would yield six or eight ounces of blood whenever the *coagulum* would give way. This woman's *pelvis* was very small: she was delivered of twins. The parts healed with considerable difficulty, as the rent of the *labium* extended to the verge of the *anus*.

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which seems exceedingly well founded, the bursting of the varicous tumor must have happened during the efforts of labour, though the sanguine inundation did not take place till afterwards: which may be easily understood by considering the compression which the cellular substance within the *pelvis* must have suffered during the passage of the child. If that inundation had manifested itself sooner in so great a degree, it is certain that it would have obstructed delivery, and that it would have been necessary to scarify the inside of the *labia*, to promote their depletion, as well as that of the more distant parts, in order to favour the exit of the child. It is therefore sometimes convenient to open varicous tumors which appear without, to prevent the rupture of those which are concealed, and that species of sanguine *infiltrations* of which we have just treated; although those tumors could not of themselves give any great obstruction to delivery.

1366. Scirrhous tumors with small or large bases may affect the internal and external part of the *pelvis*. These cannot always be removed; when they have a small neck, they may be for the most part extirpated, more especially in the time of labour, as the head of the child then presses the tumor forwards, and makes them approach the external parts. But the contrary obtains with tumors whose bases involve much of the neighbouring parts and cellular membrane: in these cases the mode of proceeding must be left to the judgment of the surgeon.

1367. Sometimes the pad which constitutes the neck of the *uterus* in the latter periods of pregnancy and in time of labour is hard, schirrous, incapable of any extension or dilatation, so as entirely to hinder the exit of the child. After a convenient delay to ascertain that the efforts of Nature cannot overcome the

resistance, and the administration of proper methods to relax it, it must be cut in several places, as some practitioners have done. Those incisions are preferable to rents which might take place in it, and have never been attended with the same consequences. They must be made more or less extensive, according to the thickness of the pad which is callous, but always so much so, that the orifice may afterwards open sufficiently.*

Indications presented by a Deformity of the Pelvis, relative to Delivery.

1368. A DEFORMITY of the *pelvis*, considered with respect to delivery, may depend on an irregularity of the bones which constitute that canal, as I have already said; on a fault in their junction; or on certain *exostoses* rising upon their internal surface. It does not always affect the *pelvis* in the same direction, part, or degree: wherefore it is not always equally contrary to the exit of the child. Most frequently the superior *strait* alone is vitiated, and it is pretty constantly from before backward: sometimes also that *strait* is found large enough, and the inferior is contracted. Between the two extremes of this deformi-

* Induration of the mouth of the *uterus* is not unfrequently met with, more especially with women advanced in life and in labour with their first child; but scirrhi I believe are rarely met with. Instead therefore of applying cutting instruments, we should employ extensive blood-letting first; should this not succeed, we always have the other in reserve. I believe this would rarely fail if the bleeding be carried to sufficient extent; and I trust I am warranted in this assertion from the success I have met with where I had feared no other resource but dividing the rigid parts was left me. See Medical Repository and Medical Museum. W. P. D.

ty, we observe infinite degrees which I have elsewhere fixed to three or four principal ones; in order to shew their effects more clearly, and cause their indications to be perceived with more justness and precision: I shall recapitulate them here in a few words.

1369. The small diameter of the *pelvis*, considered in the superior or inferior *strait*, may be half an inch less than in the natural state, without causing any great obstacles to delivery, if the child's head does not exceed the most usual size. From three inches and a half in the small diameter, which is the lowest degree of a well formed *pelvis* with respect to delivery, to two inches and a quarter or two inches and a half, which seems to be that where the exit of a child entire, that way, ceases to be possible, we find *pelves* of all the intermediate dimensions. The gradations of deformity which we meet with under the extent of two inches and a half, are not less various; since there are women in whom the *pelvis* has an opening of no more than ten or twelve lines, and in others still less. Though the latter degrees all prescribe the same indications with respect to delivery, the former leave us in some measure at liberty to choose among different modes of operating.

1370. We may refer all the resources of the art, in cases of the deformity of the *pelvis*, to the seven following.

1. The extraction of the child by the feet.
2. By means of the forceps.
3. By the assistance of crotchets and other instruments of that kind.
4. The Cesarean operation.
5. Premature delivery.
6. Regimen during pregnancy.*

* To this list our author added the section of the *pubes*, but this operation is now so entirely laid aside, that it is not any

All these resources having been employed with various success, I shall examine them as far as the limits of the work will permit; but, however, sufficiently to demonstrate their advantages and inconveniences, and determine the cases where they seem admissible.

A succinct Analysis of Delivery by the Feet; of the Use of the Forceps, Crotchets and Perce-cranes, in cases of Deformity of the Pelvis.

1371. Although I have already treated of these different methods in a very circumstantial manner, perhaps it will not be displeasing if I recapitulate here their respective advantages and inconveniences in order to bring into one view, every thing relating to deformities of the *pelvis*.

1372. Though the extraction of the child by the feet is not the most ancient of these methods, as might be supposed, at least it seems the most natural. If it pass also for the gentlest in the eyes of the vulgar, who dread every kind of instrument, an accoucheur ought to think less advantageously of it. He ought not to be ignorant how difficult it is to turn a child and bring it by the feet, when the waters have been long evacuated. Its death, too often to be feared in such cases, even when the *pelvis* is nearly of the natural size, is so much the more certain as

longer by judicious practitioners considered as a resource of the art. It is but justice to add, that our author has, by demonstrating most satisfactorily its insufficiency for the end proposed, contributed much to the cause of humanity, by bringing this horrible operation into complete disgrace. I shall therefore be excused, I hope, for having entirely omitted it in this abridgment. W. P. D.

its canal recedes farther from that state, and as its *straits* are more contracted. The extraction of the child by the feet is therefore but a dangerous method when the *pelvis* is vitiated, and only a kind of resource for the mother; often also it is not without great inconveniences to her. Besides, this method is not admissible in all cases of distorted *pelvis*, abstracting the accidents which are inevitably attached to it; since it is impossible to extract the child entire, when the small diameter of that cavity has not about two inches and a half of extent.

1373. The use of the forceps appears a little more gentle in some of these cases; because on one side, it spares the child the fatal effects of the extension and stretching of the spinal marrow, as well as of the luxation of the neck and the head; and on the other, the parts of the woman are less fatigued by it, than by the introduction of the hand to the *fundus* of the *uterus:* but it has also its inconveniences and its limits. This instrument is sometimes dangerous to the child, when the *pelvis* has only three inches in the small diameter, and much more dangerous, if not mortal, when that diameter is still farther contracted: at the same time that it destroys the child, it also exposes the mother to accidents more or less severe. The forceps are no way proper, when the *pelvis* is vitiated in the last degree, that is to say, when its small diameter has not two inches and a half of extent.

1374. The application of crotchets and other instruments destined to open the *cranium*, to discharge the brain and dispose the head to shrink, is still more fatal to the child, than that of the forceps; since death more or less sudden, and always cruel, is the certain consequence of it. Nothing can excuse the practitioner who should use them without being certain that the child is already dead; for that alone can give

us a right to prefer these instruments to other methods. If we recollect how difficult it is to obtain that certitude, we shall see with what caution they ought to be employed. The limits also, within which their use should be circumscribed, are not less contracted than those of the two preceding methods. We ought not to employ those instruments, though well assured of the child's death, but when the forceps cannot be applied. They are never exclusively indicated but in those cases where the child cannot pass whole through the *pelvis;* and even then they cease to be applicable, when that cavity has but an inch and a half, or even two inches in its little diameter: for the section of the child in the womb might then become as dangerous to the mother, and even more so than the Cesarean operation, to rescue her from which would be the view in performing it.

A succinct Analysis of the Cesarean Operation.

1375. The Cesarean operation consists in opening a passage for the child, through the *parietes* of the *abdomen* and the substance of the *uterus:* with respect to the child, it is the gentlest and most certain of all the methods we can employ for terminating the labour. We may always secure it from accident by the Cesarean operation; because we can render its exit as quick as easy, by giving a little greater extent to the way the instrument prepares for it.

1376. If we had no other view but the preservation of the child, we should therefore prefer this method to the others, whenever there is reason to fear any obstacles to delivery by the usual passage: but the mother having the same right to life, and this

operation being generally fatal to her, whatever care we take to assure its success, it ought not to be practised but when evidently necessary, and when delivery cannot be performed otherwise. If nothing but the death of the child can authorize us to dismember it in the womb of its mother, when it cannot be extracted entire; so also, its life alone can justify the Cesarean operation, in the same case. I however except that where the *pelvis* is contracted in the highest degree, that is to say, where its small diameter is under two inches: for then there is no other resource to deliver the woman, but the Cesarean operation. It is unfortunate when her child is dead, to have nothing to present her but a corps, for the reward of her resignation, and the sacrifice which she in some measure makes of her own life. Though she runs an exceeding great risk of losing it in consequence of the Cesarean operation, she would be much less sure of preserving it, if she were not delivered in that manner; as we shall see in the article which treats of the rupture of the *uterus*, and of *extra-uterine* pregnancies.

1377. The consequences of the Cesarean operation have almost always been so formidable, that many accoucheurs of the last age, and even of the present, have not dared to perform it. *Mauriceau*, who in his time was the oracle of the science, as *M. Levret* was in ours, recommended waiting for the woman's death to open the body, and treated as fabulous the account of the Cesarean operations which were then said to have been performed with success. But by thus exposing the mother, we should often have to reproach ourselves with having suffered both to perish; for in those cases her death hardly ever happens before that of the child.

1378. The authority of *Mauriceau* cannot be re-

ceived as a law among us, as in his own time. That operation has not only been performed with success, and several times on the same woman, if all the observations which have been transmitted to us are true, but we also remark that some of those who have undergone it, have suffered no other accidents in consequence, than what are usual in large simple wounds penetrating the *abdomen;* and which are even looked upon as necessary for their reunion. Such observations as these have made some practitioners believe that the danger of the Cesarean operation did not essentially depend on the injury done to the parts concerned in it, but on the morbific state in which those parts, and the woman also, were at the time of the operation.

1379. It is very certain that the low and exhausted state which succeeds a long and severe labour, as well as the *erithismos* and inflammatory state of the *uterus*, may increase the accidents annexed to the Cesarean operation, as much and perhaps more than the manner in which it is performed. But the unfortunate consequences which it has almost always had, did not proceed from those sources only, since the fate of those women who have had it performed by the most skilful surgeons, after convenient preparations and at the most favourable time, has not been very different from that of others who have suffered it from people without experience, and even absolutely strangers to the art. We shall therefore never be able to prevent or avoid every thing which may render the success of such an operation uncertain.

1380. Two sorts of hemorrhages are to be feared in the Cesarean operation, if we consider them relatively to their source: one comes from the sinous vesand sels of the *uterus* which terminate in the *placenta*, the other from the section of the principal branches

of the *uterine* arteries and veins which are found near the lateral parts of that *viscus*. We may prevent the latter by operating at the middle of the belly, and opening the *uterus* at its anterior part; but it is not so with the former; that may happen during the operation, if we should cut the *uterus* at the part where the *placenta* is ingrafted, which we cannot always avoid; or it may supervene some time afterwards, though the incision have been made far from that part. In the latter case it is the effect of an atony of the *uterus*, like the hemorrhage which sometimes succeeds a natural labour. In the other, it manifests itself immediately, because it proceeds from the section of the *sinuses* and other uterine vessels, and the woman may lose a great deal of blood before the operation be finished; as I observed in one of the two cases that I shall relate.

1381. An hemorrhage is not the accident most frequently observed after the Cesarean operation: an inflammation of the *uterus* and of the other *viscera* of the *abdomen*, fever, suppuration, a discharge of the *lochia*, either *sanguine*, *purulent* or *lacteal*, into the abdominal cavity, accompany it much more frequently; and when the woman has the good fortune to escape from so many perils, she almost always finds herself exposed to considerable hernias, very difficult to manage, but which might easily be prevented by means of a proper bandage.

1382. Since the Cesarean operation is so dangerous to the woman, that scarcely one in ten survives it, it ought not to be undertaken but in cases where it is evidently indispensable: but that is what accoucheurs have determined in a very vague and uncertain manner, with respect to a deformity of the *pelvis*. We ought not to perform it but when that miscon-

formation is such as to leave no hope of bringing the child alive by the natural passage.

1383. Without endeavouring to carry the hand into the *uterus* (which ought to be carefully avoided in cases which require the Cesarean operation), in order to ascertain whether it will pass through the *pelvis* freely or not, with one of the child's feet, as the passage from *M. Levret* seems to insinuate, we may determine the cases where the operation becomes actually necessary; because we may with the finger alone, or with any kind of *pelvi-meter*,* measure the extent of the small diameter of the *strait*, within a line or two. See par. 123 and following, to par. 137 inclusively. I am of opinion that it is perfectly indicated, whenever the extent of the diameter is not more than two inches and a half.

Of premature Delivery, proposed on account of a Deformity of the Pelvis, with a view of avoiding the Cesarean Operation.

1384. Some examples of children born at the eighth or at the seventh month of pregnancy, and even sooner, with a constitution strong enough to complete their development like those born at the natural period, and to live as long, have suggested the idea of premature delivery as a salutary resource for those whose birth would be impossible at the period of nine months, on account of a deformity of the *pelvis*, without having recourse to the Cesarean operation. Although it might suffice to object to its partisans the little success they have experienced from

* See Fig. III. page 80.

it in such cases, I shall nevertheless examine whether there be any parity between a premature delivery which takes place naturally in all respects, and one brought on by art at the same period of pregnancy.

1385. Without entering into the interest which many persons have had to make children born at full time pass for those of seven months, I shall remark that most women are never sufficiently sure of the time when they became pregnant, for us to lay down any thing very certain concerning the epoch of delivery from their account. In the same manner as some women have thought they went ten and even eleven months, because a suppression of the menses and slight indispositions had in them preceded conception; other women have imagined they were delivered at seven months, because they had been regular in the two first, and because the circumstances which they look upon as so many proofs of the existence of pregnancy, had not manifested themselves till the suppression of the menstrual evacuation.

1386. The neck of the *uterus*, in women whose labour comes on naturally at seven or eight months, develops much earlier than in those who go the usual time. The pains begin without being brought on by any apparent cause; they are not the effect of a want of expansion in the *uterine* fibres, nor of the accidental irritation which results from it; but of the want of an equilibrium between the fibres which constitute the neck of the *uterus*, or the resistance which they oppose, and the action of the other parts of that *viscus*, which press the produce of conception downward; as is generally observed at the period of nine months. Those pains continue and succeed each other, as in a labour of full time; their gradation is the same, and their effects manifest themselves in the

same order. From the premature development of the neck of the *uterus*, I have several times predicted to my pupils, as early as the fourth month of pregnancy, that labour would come on naturally in the fifth; at other times, at that epoch, that it would terminate at six months, &c. and the event has always confirmed my judgment.

1387. We hardly ever meet with those favourable dispositions at the period of seven or eight months, in women who have the *pelvis* so deformed as to render delivery impossible at the period of nine, and consequently in whom it seems that it might be advantageous to force it to come on prematurely. The neck of the *uterus* at seven months has seldom begun to open; it is still very thick and very firm. The pains, or the contractions of that *viscus*, cannot then be procured but by a mechanical irritation pretty strong and long continued; but those pains being contrary to the intentions of Nature, often cease the instant we leave off exciting them in that manner. If we break the membranes before the orifice of the *uterus* be sufficiently open for the passage of the child, and the action of that *viscus* strong enough to expel it, the pains will go off in the same manner for a time, and the labour afterwards will be very long and very fatiguing; the child, deprived of the waters which protected it from the action of the *uterus*, being then immediately pressed by that organ, will be a victim to its action before things be favourably disposed for its exit, and the fruit of so much labour and anxiety will be lost.

1388. Premature delivery, obtained in this manner, is always so unfavourable to the child, that I think it ought never to be permitted except in those cases of violent hemorrhage which leave no chance for the woman's life, without deliverance: the nature

of the accident also disposes the parts properly for it. Supposing it be admitted in cases of deformity of the *pelvis*, in order to dispense with the Cesarean operation at the time of the child's maturity, as some have recommended, should it be at seven or at eight months that we ought to solicit it?

1389. To consider this resource, if premature delivery can be regarded as such, only with respect to the advantages it may procure to the child, we ought to recur to it as late as possible; for it is, in general, so much the stronger, and so much the more *viable* as its birth approaches nearer to the period assigned it by Nature: it should therefore rather be at the eighth month than at seven. But if we examine it in another point of view equally essential, it ought to be brought on sooner or later, according to the degree of narrowness or deformity in the woman's *pelvis;* for that deformity may be such, as to give as much obstruction to the exit of a child of seven months, in some women, as to one of eight in others. Premature delivery, if we were always to solicit it at the same period, might be as long, as laborious, as fruitless, and even as impossible, in some cases, as if we had not undertaken to deliver the woman till the ninth month, The following cases will prove the truth of this observation.

1390. A woman whose two first children had been victims of the efforts of labour, on account of the deformity of the *pelvis*, had a fall in the eighth month of her third pregnancy, which at first I looked upon as a fortunate accident; because it immediately occasioned a discharge of the waters, and a few hours afterwards pains strong and frequent enough to give hopes of a speedy deliverance: but I was disappointed. Having waited twelve hours, and then seeing

that the child's head, though well situated, and besides much smaller than those of the two former, was not at all advanced, notwithstanding the strength of the pains, and the violence of the woman's efforts, I determined to extract it with the forceps. I found as much difficulty in it as in the preceding labours, and the fate of the child was the same as that of the others. But how much more difficulty should I have found, if the *pelvis* of this woman, which had, according to the estimation I made of it, two inches three quarters in the small diameter, had had no more than two inches, or even less, like several which I have by me?

1391. Another woman, on whom the Cesarean operation had been successfully performed in her first pregnancy, was delivered four times since, but at most, not later than at seven months; and though the children were small for the time, the labours were always very long and severe. In the third of them she was delivered in my theatre, in presence of forty-five pupils at least, after a brisk labour of more than fifteen hours: the woman thought herself at full time, because her *menses* had been suppressed more than nine months. I predicted her labour some days before, and I added that she was at most in the seventh month of her pregnancy, and the event soon proved it to be true. The child, when born, weighed no more than two pounds eight ounces and a half; the diameter of its head was but two inches eight lines from one *parietal protuberance* to the other, that is to say, in its greatest thickness; but restored to its natural state, for at the moment of its exit it was depressed on one side, at the part which had lain against the projection of the *sacrum*, two lines at least. The child lived but two days and a half; I keep the skeleton of it in my cabinet. The fourth labour was still

longer, though the child was as small: this last died almost as soon as born.*

1392. Such are the fruits to be expected from premature delivery, when Nature has set some bounds to the deformity of the *pelvis:* what can be hoped from it, when the diameter of the entrance of that cavity is no more than twelve or fourteen lines, as in a *pelvis* in my collection, or when it is still narrower.†

Of Regimen; considered as a Means of preventing the Difficulties of Labour, which proceed from a Deformity of the Pelvis.

1393. If the bigness of the child were in proportion to the quantity and quality of the aliment taken by the woman during her pregnancy, as the vulgar think, the regimen which some have recommended to make her observe, with a view of moderating or limiting the growth of her child, would be very laudable in some cases; but we see the contrary too often. Women nourished in the bosom of plenty, and who, in the variety of aliments which the easiness of their fortune procures them, can scarcely find enough to satisfy themselves, have children very small and extremely delicate; while others exhausted by disease, or by being compelled to live on the most rig-

* These observations ought to justify *M. Millot* in the eyes of those who have accused him of having performed the Cesarean operation on this woman without necessity.

† Notwithstanding what our author urges against this practice, there are instances of success from it on record. It remains therefore for the decision of future experiment.
W. P. D.

orous diet, often have children very large and strong. I have succoured some consumed by a *marasmus*, and scarcely able to breathe, who have produced children of nine or ten pounds; others have grown strong and lusty, and increased their weight thirty or five and thirty pounds, though their children weighed no more than five or six pounds and a half.

1394. Besides, the little difference presented by the bony frame in a great number of children at full time, evidently shows that any regimen observed by the mother, even if it could moderate their growth, would be of no use, except to those who have to pass through a *pelvis* but little deformed and whose dimensions are nearly in the natural state. Whatever influence the regimen of the pregnant woman may have on the development of her child, it cannot be reckoned among the resources of our art, in cases of extreme deformity of the *pelvis*.

Of the Cesarean Operation.

1395. That operation is called Cesarean, by which any other way is opened for the child, than that destined for it by Nature. Though for that purpose we sometimes only cut through the common and proper coverings of the *abdomen*, we are generally obliged to open the *uterus* also, and it is particularly in this latter case that the operation has received the name of Cesarean; for in the former it may be expressed simply by that of *Gastrotomy*. It seems to me useless to distinguish it into *abdominal* and *vaginal*, as has been done lately; comprehending under that new denomination all operations performed on the neck of the *uterus*, without affecting the neigh-

bouring parts: for we might with as much reason give the same name to incisions in the *perinæum*, to the section of bridles or cicatrices which narrow the *vagina:* to that of the *hymen*, tumors, &c. if the child could not be born without those aids.

1396. The origin of the Cesarean operation is too obscure, for us to be able to assign its epoch; that is to say, the time when it was first put in practice. Some have fixed it at the birth of *Julius Cesar*, and others have carried it farther back. I have already stated, that before the present age, the greater part of surgeons dared not perform it before the death of the woman; because they thought it essentially mortal. But care has been taken since to collect the most known and proper cases to cause it to be adopted, not as a certain resource for the woman in all cases where the deformity of the *pelvis* may obstruct delivery in an insurmountable manner, but as the only one which can be salutary. The collection of M. *Simon*, inserted among the memoirs of the Royal Academy of Surgery, contains seventy or seventy-two of these cases, in which we observe that the operation has been performed with success; and we might at present add an equal number to them.

1397. Among the former we find some on whom it was performed without necessity, since the women had been delivered naturally before, or were safely delivered afterwards. This collection of M. *Simon* also teaches us that the greater part of these operations to the number of seventy and upwards were performed on a few women: some of them having submitted to it three or four times; others five, six, and even as far as seven times: which, if they were all true, would superabundantly prove that it is not essentially mortal, since there is no need of more than a single example to establish the proof of it.

Of the causes which require the Cesarean Operation; the Preparation necessary for it; the proper time to perform it; and the Instruments and other requisite Apparatus.

1398. A DEFORMITY of the *pelvis* is not the only cause which may render delivery impossible by the natural passage, and which ought to determine us to recur to the Cesarean operation; certain affections of the soft parts which I have already mentioned, such as scirrhous tumors with a very large base, which cannot be extirpated without exposing the woman to a more imminent danger than that of the Cesarean operation, as well as *extra-uterine* pregnancies, may require the same assistance: but it would be abusing it to employ it in all the cases for which it has been lately recommended.

1399. This operation may be practised both on the living, and on the dead woman. If it requires a great deal of attention with respect to the former, so also we cannot entirely dispense with it in regard to the latter; because it is sometimes very difficult to be immediately certain whether she be really dead or not. If we waited to perform this operation till the most certain signs of death manifested themselves, it would be useless to the child, who cannot long survive its mother, if it remain in the womb. On the other side, we ought not to consign her to an inevitable fate, when perhaps she is only dead in appearance.

1400. We cannot too often recal the observation of M. *Rigaudeaux** to the minds of those who may

* M. *Rigaudeaux*, principal assistant surgeon of the hospitals at *Douay*, and accoucheur.

have occasion to perform these sorts of operations: it is inserted in the *Journal des Savans* for the month of January 1749. At the same time that it demonstrates how difficult it is, in some cases, to distinguish a state of *asphyxy* from real death, it teaches us that it is not always necessary to open the body of a woman who appears to have been some time deprived of life, in order to save that of the child. That surgeon not having been able to go to a woman in the country as soon as he was called to deliver her, learned on his arrival, that she had been dead two hours, and that they had not been able to find any person to perform the Cesarean operation on her. Having wiped off the sweat which covered her, perceiving that she still retained a little warmth and suppleness in the limbs, that the orifice of the *uterus* was much dilated and the waters well gathered, he determined to deliver her by the usual passage, and performed it easily, bringing the child by the feet, after turning it. Though the child appeared dead, he did not fail to pay some attention to it, as soon as he had delivered the mother, and recommended both of them to the women who were present. Their pains which appeared fruitless at first, were not so in the sequel. They revived the child so perfectly, that a few hours afterwards it cried with as much strength as if it had been born in the most natural manner. M. *Rigaudeaux* going to see the woman again before he returned home, caused the sheet in which she was wrapped, to be removed, and finding her limbs as supple as at first, though she appeared to have been dead more than seven hours, he tried some methods proper to ascertain whether she were really so or not, and did not go away till he had made the assistants promise that they would not put her again into her winding sheet till her limbs should be stiff. If he was

agreeably surprised when he found the child was restored to life, he was much more so when they came in the evening to inform him that the mother was revived two hours after he had left her. It was on the eighth of September 1745, and both mother and child were still alive in August 1748; but the former had continued deaf, paralytic and almost dumb.

1401. If immediately after the woman's death, we were to find dispositions as favourable to delivery, as those stated in the observation of M. *Rigaudeaux*, we ought to prefer the extraction of the child by the usual passage to the Cesarean operation. We ought never to perform the latter but when the parts are not so favourably disposed, and then proceed with as much care as if we expected the greatest success with regard to the mother. A simple incision in the rection of the *linea alba*, and about seven or eight inches long, ought to be substituted for the crucial section which has almost always been made in similar cases.

1402. Before we subject the living woman to such an operation, it might be useful to prepare her by general remedies, such as bleeding, purging, warm baths, &c. as is done with respect to the other greater operations; these precautions would sometimes perhaps insure success. But unfortunately we cannot always employ them, except bleeding; because we may be called too late, and often even when the parts of the woman have been fatigued, irritated, contused or lacerated by the manœuvres of a bold and ignorant hand.

1403. The Cesarean operation, like many others, has a time of election and one of necessity: the latter always takes place when the waters are evacuated, except circumstances foreign to those which oblige us to operate, present more urgent indications. The

instant of the woman's death, no matter at what period of gestation, and that of the child's passing into the cavity of the *abdomen*, from a rupture of the *uterus*, also constitute that time of necessity. As to the time of election, some think we ought not to operate till after the evacuation of the waters, and others that we ought to do it before, and as soon as the labour shall be certainly begun; provided that the neck of the *uterus* be effaced, and the orifice open enough for the discharge of the *lochia:* this time appears to me preferable to the former.

1404. If we should operate at the beginning of labour, and before the waters are evacuated, "we "should," says a modern author, "risk leaving the "*uterus* in a state of atony, by disincumbering it "too suddenly: which would infallibly cause a flood-"ing, that would carry the woman off." But the reasons that author gives are not so conclusive, nor so conformable to the present notions of physiology. The motive which determined M. *Levret* to recommend operating before the opening of the membranes is much better founded: by operating before that instant, says he, the extent given to the incisions, as well in the containing parts of the belly as in the body of the *uterus*, would be much smaller after the exit of the child, than if the operation had not been performed till after the discharge of the waters. It is very certain that an incision of six inches affects a smaller number of fibres and vessels, when the *uterus* is still distended by the waters, than when it is strongly contracted on the child's body, and reduced a fifteenth or a twelfth part in its size. In the latter case, an opening of six inches is much larger relatively to the volume of that *viscus*, than when it is in its greatest degree of dilatation.

1405. It seems to me to be advantageous to have

two histories in order to perform this operation well, viz. one straight and one curved; the latter must cut with its convex edge, and the former must have a very narrow blade and be probe pointed. We ought to have crooked needles and waxed thread to stitch the external wound where it may be thought necessary; fine linen, compresses, a bandage to go round the body, and some spirituous liquors, such as *aqua vulneraria*, brandy, or spirit of wine, which may be lowered according to circumstances with common water.

1406. The woman should be placed on a bed pretty narrow and sufficiently high, that the operator and his assistants may act freely, and with as little incumbrance as possible. It should also be on that on which she is to remain, that we may not be obliged to remove and disturb her immediately after the operation. It must be covered so that the bed be not wetted with the blood and water, and that when the cloths are withdrawn the woman may be left dry. She ought to be laid on the back, with the legs and thighs extended while the incision is made; and half bent, during the extraction of the child. We may also place a bolster under her loins to support them, and make the belly more protuberant. We ought also, before we operate, to put on her lying-in shift, that is to say, one very short, and open before.

Of the Part where the external Incision ought to be made.

1407. There is scarcely any part of the *abdomen* where the external incision has not been made in the Cesarean operation. Some have made it on the sides;

others transversely, either above or below the *umbilicus;* and several in the *linea alba.* Among the former, some have advised making it obliquely, descending from the extremity of the cartilage of the third false rib towards the *pubes;* others have given it the form of a crescent, and M. *Levret* directed it to be made parallel to the external edge of the *rectus* muscle, but so that it should be equidistant from that muscle, and from another line drawn from the extremity of the third false rib to the superior *spine* of the *os ilium.* They have all recommended making it on the right, or left side, according to the state of the interior *viscera;* in order to avoid, for example, carrying the instrument on a scirrhous tumor, or a hernia, &c. Besides these reasons for a preference, M. *Levret* advised having a regard to the accidental attachment of the *placenta*, in order to determine on which side to operate, and not to open the *uterus* in the part where that body is, as it were, ingrafted. I have already demonstrated the uncertainty of the signs by which that celebrated accoucheur affirmed the part where the *placenta* is attached might be known, and consequently the little attention due to the latter precept. If we must operate at the side of the belly, it ought to be on that where the *fundus* of the *uterus* is inclined; in order that that *viscus* may present better to the opening, and that the intestines and *omentum* may not immediately escape through the wound.

1408. The incision seems more fruitful in accidents and more difficult to execute at the side of the belly than in the *linea alba.* There are at the side, as in all other parts, the *tegument*s and the cellular membrane, and we meet moreover with three muscular planes whose fibres intersect each other in such a manner that we cannot avoid cutting the greater part

of them across or obliquely: which causes them to retract, and afterwards hinders that coaptation of the whole thickness of the edges of the wound, necessary for their exact reunion. By making the incision exactly in this part, we sometimes cut branches of the *epigastric* veins, which run beyond the edge of the *rectus* muscle on which the incision often extends; because it acquires a great breadth in the latter periods of pregnancy: which causes an hemorrhage sometimes considerable enough to give some alarm, and to oblige us to tie the vessels, or touch their extremities with styptics, as was done by M. *Piestch.** When we make the incision at the side, the *peritonæum* is scarcely open, before the intestines, confined in the *abdomen*, escape, dilating at the same time, and increase the natural difficulties of the operation. If we are not always secured from this inconvenience by making the incision in the *linea alba*, at least it will happen more rarely, and much fewer intestines will always escape. The longitudinal axis of the *uterus* being never exactly parallel to the oblique incision of the *abdomen*, we cannot open that *viscus* without cutting the greater part of its fibres transversely; which causes them to retract, renders the wound more gaping, afterwards favours the exit of the *lochia* that way, and exposes the woman to other accidents.† When the section is made in the *linea alba*, we only separate, as it were, the longitudinal fibres of the *uterus;* so that the wound contracts much more

* M. *Piestch* was obliged to apply this styptic to a branch of the epigastric artery which he had cut in the Cesarean operation. See *Journal de Médicine, Suppl.* 1770, page 173.

† On opening the body of a woman, who a few days before had undergone the Cesarean operation, a portion of intestine was found engaged and strangulated in the opening of the *uterus.*

after the operation. Lastly, in the lateral section of the belly, we cannot open the *uterus* in its middle, but the incision must be made near one of its sides, and therefore runs more risk of affecting the vessels which may be considered as the source of all those that are distributed to that organ, the injury of which is more to be dreaded than that of the *sinuses* or reservoirs that lead to the *placenta*.

1409. M. *Solayres*, in his Lectures on Midwifery, used to tell us, that the inconveniencies attached to the lateral and oblique incision of the *abdomen*, would one day engage practitioners to make it in the *linea alba*. *In the mean time*, added he, *I advise you to perform it in that part, the incision is easier and less painful, because there are fewer parts to cut; the* uterus *presents itself to the hands, it is divided into its middle part, and in a direction parallel to its principal fibres.*

1410. In whatever part we may open the *abdomen*, and in whatever method we may perform it, we shall never much diminish the danger of the Cesarean operation; because we cannot remove every thing which may oppose its success, nor procure every thing which might insure it. It ought to be performed methodically, that is an incontestable truth, and the method which would be quickest, easiest, and least painful to the woman, would be preferable to any other, provided the consequences of it were not more disagreeable. In performing the section in the *linea alba*, surgery has made one step towards improvement, but not the most difficult one. It is necessary to guard against the purulent and milky discharges which are made into the *abdomen;* to defend the *viscera* from the contact of those humors, and preserve them from the dangerous effects of them: the section in the *linea alba* has not those advantages. It had suc-

ceeded twice* at the time I published the first edition of this work, but four women afterwards died in consequence of it, and extravasations of putrid matter were found in them. If it has had other successes since, it has also had other victims. I have performed it twice; but though I saved the children, one of the women died on the fourth day, and the other on the fifth: the latter was of a very bad constitution, and so scorbutic as to leave no hope of rescuing her from death; but the former was robust, and in a proper state to bear the operation. I was obliged to proceed to it without delay; she having been in strong labour twenty-four hours, and the waters discharged twenty-one or thereabouts. It was M. *Sigault* who sent for me to this woman; the case not seeming to him favourable to the section of the *pubes*.

1411. *It is easy to perceive*, says M. Deleurie, *all the advantages of having the wound in the uterus as I may say before the eyes, during the progress of the cure, and having it answer directly to the external incision; by that means the humors discharged from the uterus have a free exit.* These advantages would doubtless be very valuable, and would often insure the success of the Cesarean operation: but hitherto they have been rarely obtained, and then merely by chance. To insure them a little farther, the *uterus* should be opened at the top of its anterior part, almost to the centre of its *fundus*, and not at its inferior part, as has been most frequently done: for that is the region which has been always found opposite the external wound, on examining the bodies of those women who have died in consequence of the Cesarean operation; while the wound in the *uterus* was

* Messrs. *Deleurie* and *Waroquier* seem to be the only surgeons who have performed the Cesarean operation in the *linea alba* with success.

concealed behind the *teguments* that had been preserved above the *pubes*, and which it is almost impossible not to preserve, on account of the bladder; which would equally favour the extravasation of the *lochia* into the abdominal cavity, by masking a part of the wound in the *uterus*, even if that of the *teguments* could be extended to the *pubes*.

1412. If the wound in the *uterus* corresponds with that in the *abdomen*, at the time of the operation, it will not be found opposite to it an instant after, and still less during the cure; unless the edges of the one contract adhesions with those of the other; which has sometimes happened. To procure this desirable relation, we ought to prolong the external incision to the height of the *umbilicus;* begin that of the *uterus* about the middle of that incision, and extend it above the superior angle, cutting under the coverings of the *abdomen*, as I did in the two women on whom I performed it: the two wounds would become parallel through their whole length, in proportion as the *uterus* should contract its dimensions after the delivery, and nothing more would be necessary to preserve their parallelism, than to fix that *viscus* by a bandage properly disposed round the belly.

1413. It seems to me to be much more important to prolong the external wound to the *umbilicus*, or even above it according to circumstances, than to carry it downwards to the *pubes;* because by that we discover the body of the *uterus*, which should be opened as high as possible. By prolonging the external incision downward, we only expose the inferior part of that organ, which in the natural state constitutes its neck, and which ought to be preserved in the Cesarean operation.* Besides, an opening

* The neck of the *uterus* is not only that little pad called the *os tincæ*, in the natural state, and which projects more or

made in this part of the *uterus* would always be out of the surgeon's sight, in the sequel, even if he should divide the coverings of the *abdomen* as far as the *pubes;* since the bladder always covers the major part of it, even when it contains no urine. See the end of par. 1411.

1414. By opening the *uterus* in its inferior part, an easy passage is prepared for the *lochia* into the *abdomen;* because the cavity of the body of that *viscus*, which serves as a reservoir for those fluids, remains almost entire, and is above the incision, which seems to have been made in the most depending part merely to favour their discharge. Besides, the incision preserving after the operation a greater extent than the orifice of the *uterus*, and presenting fewer obstacles to the passage of the *lochia*, also favours their extravasation. By opening the *uterus* near its *fundus*, the inferior part of its cavity remaining entire, may serve for a first receptacle for those fluids, as they distil from the inferior vessels; so that they may escape more easily by the neck. Moreover, as the opening will in this case be opposite the wound in the external *teguments*, the extravasation will not be so easily made into the cavity of the *abdomen*. If we recollect the fortunate successes which bold but unskilful men have obtained from the Cesarean operation, by opening the belly transversely at the height of the *umbilicus*, and the *uterus* doubtless in the *fundus;* and the example of M. *Guenin*, who extended the incision

less into the *vagina;* it often forms more than a third of the whole length of the *uterus*. Though it is entirely developed in the two latter months of pregnancy, it recovers its form after delivery, and returns insensibly to its natural state. It is the fibres of that part which I advise not to be cut in the Cesarean operation; but to guard against that, the incision must be begun at least two inches above the circle which constitutes the edge of the orifice.

of that organ to within an inch of that part, we shall perceive all the value of this remark; it is that which has engaged M. *Lavverjat* to reduce this procedure to a regular method.* Two or three successes not appearing to me sufficient to entitle it to a preeminence over the other methods, I neither adopt nor reject it; because all of them have obtained some. In the mean time I shall prefer the section in the *linea alba*.

Method of performing the Cesarean Operation.

1415. After having determined the part of the *abdomen* and of the *uterus* proper to be opened in the Cesarean operation, it is necessary to indicate the manner of doing it. But before all, it seems important to observe that we must begin by emptying the bladder with the *catheter*, especially when the woman has not made water for some time. Notwithstanding this precaution, the bladder still sometimes rises up in such a manner before the *uterus*, that it conceals the major part of it; as I observed after the external incision, in a woman on whom I saw the operation performed. The *fundus* of the bladder, in that case, was almost as high as the *umbilicus*, and the bladder itself, though care had been taken to evacuate the urine from it, presented through the whole extent of the incision in the *teguments* of the *abdomen*.

1416. The woman being placed as directed in par. 1406, we must cut deeply through the *teguments* and fat, if the subject be lusty, till we perceive the *aponeuroses* which form the *linea alba*. That must be

* *See* his work entitled, Nouvelle Méthode de pratiquer l'Opération Césarienne, 1788.

cautiously divided to discover the *peritonæum* in which a small opening is to be made; proceeding in that respect nearly as in the operation for a hernia.* We introduce the fore-finger of the left hand into the *abdomen*, to lift up the *teguments* a little, and remove the parts which might be hurt, out of the way of the instrument, to which the finger serves as a conductor.† We then extend the incision towards the *umbilicus*, or the *pubes*, according as it was begun higher or lower, cutting from within outward. Though the bistory with a convex edge is proper for the first incision, I think the straight bistory with a probe point and narrow blade is preferable for the latter: it renders the grooved director needless, which would be necessary to conduct the common bistory.

1417. This first incision must extend from the *umbilicus* to within an inch and a half at most of the *symphysis* of the *pubes*. It will be a little longer than it is usually made, it is true; but then we discover the upper part of the *uterus* better, and we may open it nearer to the *fundus*. It seems to me better also to open the *peritonæum* from above downwards, than from below upwards; taking care to go along one of the sides of the bladder, when it rises up in the manner mentioned in the latter end of par. 1415.

1418. While we cut the teguments of the *abdomen*, an assistant should fix the *uterus* in the middle, by pressing a little with both hands on the sides, and another make a similar pressure above the *umbilicus*, in order to circumscribe in some measure the *uterine*

* The *peritonæum* is twice opened in this operation, once in penetrating into the *abdomen*, and again in cutting the *uterus*. The Cesarean operation cannot be performed without it.

† A better method is to introduce the fore and middle fingers, and cut as it were between them. W. P. D.

tumor, and hinder the intestines from presenting at the wound.

1419. The *abdomen* being open to a convenient extent, we are to cause a little stronger pressure to be made above the *umbilicus*, to bring the *fundus* of the *uterus* nearer to the level of the superior angle of the wound, and then open it in the middle of its anterior part, with a convex history, till we perceive the membranes. We then make a small opening in them just large enough to receive the finger, taking care not to wound the child; and pass the fore-finger of the left hand into their cavity, to serve as a conductor for the straight history, with which we continue to open the *uterus* cutting from within outwards, in the same manner as we did in dividing the external parts; extending the incision at least to the height of the superior angle of the wound in the *teguments*, and terminating it at an inch and a half or thereabouts above the inferior angle; because by continuing it farther towards the *pubes*, the lower part of it would be concealed behind the bladder, in a few hours after the operation. The extent of this incision must be determined by the volume of the child, which we suppose to be such that its head is generally ten inches or ten and a half in the small circumference. An opening of five or six inches is commonly sufficient; but in general it is better to make it a little larger than smaller, to avoid tearing its angles when the child passes it. That augmentation, says M. *Levret*, is of little consequence, on account of the diminution the wound undergoes after deliverance, especially if it be made before the bursting of the membranes, as I recommend.

1420. We must cut the *placenta*, if it should present its centre under the edge of the history: but when we meet with its edge in the neighbourhood of

the wound, it is better to detach it in order to open the membranes; as I did in the first of the two operations I have mentioned, and as is done when it is attached to the neck of the *uterus*.

1421. Having opened the *uterus* properly, we insinuate the hand into it to find the child's feet and bring them without; proceeding in that respect, in the same manner as if we wanted to turn the child, and extract it the natural way. We disengage the arms in the same manner, when the shoulders are sufficiently advanced, and afterwards introduce a finger into the mouth to bring along the head. We ought not to swerve from this rule, except when the head presents naturally to the wound in the *uterus;* if it be not expelled speedily by the contractile efforts of that *viscus*, we may favour its exit by pressing lightly at the sides of the woman's belly, and at some distance from the incision; or else by insinuating the fore-finger of each hand, under the angles of the lower jaw.

1422. The *uterus* continuing to close after the exit of the child, soon forces the *placenta* towards the wound and expels it; which we may also favour by pulling the umbilical cord, and much more certainly by taking hold of the edge of the *placenta* with the fingers as soon as it presents, in order to disengage it more easily, and make it present a smaller volume than if we brought it along by continuing to pull the cord. We must also take care to extract any clots which may have formed in the *uterus*, and to pass a finger through the neck of that *viscus*, to force any that may have lodged there into the *vagina*. If the *uterus* remain soft and inactive after the exit of the *placenta*, we must touch it a little externally and stimulate it, to rouse it from that state of languor and oblige it to close itself.

1423. There is little blood discharged from the wound in the *uterus*, when it has been made in the middle of its anterior part; except the *placenta* be attached there, and even then the hemorrhage does not last long, if the *uterus* contract forcibly. It is not so when the incision has been made elsewhere and towards its sides; when the instrument has divided some of the large arterial and venous branches, the blood may flow more abundantly, because the hemorrhage lasts a longer time, however strongly the *uterus* may contract. If it should continue so copiously as to occasion any alarm, we ought to touch the lips of the wound with cold water, or even with a little rectified spirit of wine, as some have already recommended:* for want of that, which is not always at hand, we may use vinegar and water.†

1424. The hemorrhage may supervene some hours, and even several days after the operation; but, *cæteris paribus*, it is then less dangerous than that which proceeds from the division of the large vessels which correspond with the *placenta*, or of those arterial and venous branches I have just mentioned. It will suffice, in order to stop the flow of blood, to excite the tonic action of the *uterus*, which is always languid in those cases; either by rousing and stimulating that viscus externally, or by injecting into it, through the wound, cold water, pure, or with a little vinegar, according to the degree of atony; as is done by the orifice, after a common labour, in flooding cases.

* See the Institutes of Surgery by *Heister*.

† Or what has been found still better for the suppression of hemorrhagy, is a strong solution of the acetate of lead, or the spirit of turpentine. W. P. D.

Of the proper Treatment after the Cesarean Operation.

1425. If any blood and water have been extravasated in the cavity of the *abdomen* during the operation, we ought to procure its discharge before we dress the wound; either by placing the woman in a convenient position, or only by pressing on the two sides above the hips. Sometimes injections of warm water have been employed, to wash the surface of the *viscera* which had been bathed with those fluids. Such extravasations will seldom happen at the time of the operation, when it is performed in the *linea alba*.

1426. The wound in the *uterus* requires little attention: it contracts and diminishes more than half in a very few minutes, except when that *viscus* remains in a state of atony, and cannot close itself. This wound would easily heal, if it did not generally serve for an outlet to those abundant fluids which the *uterus* discharges in the first days of lying-in. The reunion is the work of Nature, and the hemorrhage alone requires a particular attention. In all ages, the *suture* has been used to procure the reunion of the external parts, and it has been performed in all possible ways. It is, without dispute, the most certain method of obtaining a firm and solid cicatrix: the necessity of keeping a passage open for the discharge of the fluids which escape through the wound in the *uterus*, is the only thing which can counterbalance its utility, and it is with that view that those who have employed it have preserved a kind of opening

at the bottom of the wound, by passing a little unravelled bandage round it.*

1427. The *suture* is not however indispensably necessary after the Cesarean operation, that is a fact which experience has already several times proved; because there is no wound whose edges may be more easily brought together; pregnancy having disposed all the surrounding parts favourably for it, and the coverings of the belly being then a third, at least, larger than necessary to embrace the *viscera* closely. But it must be confessed that there is no circumstance in which it is more difficult to keep those edges in perfect contact, on account of their thinness and the little support they have underneath, especially when the incision has been made in the *linea alba;* the smallest movements of the woman, and the least pressure on the environs, destroying that contact so necessary to a perfect reunion: so that very often, at the time of dressing, a bunch of intestines has been found without, quite shrunk up under the bandage. The utility of the *suture* therefore seems to arise here, from the very dispositions which lead us to dispense with it.

1428. The *suture* has inconveniences; every one knows that it has often been found necessary to loosen it, and even cut it; either on account of the tension of the belly, or to give an exit to clots of blood formed in its cavity: but notwithstanding that, I think it ought not to be entirely rejected. The quilled *suture*, which is neither more difficult to make nor more painful to the woman, than the interrupted *suture* which has been substituted for it without any reason, is the most proper for obtaining the aggluti-

* A bandage with the cross threads drawn out at the part opposite the wound.

nation of the whole thickness of the divided parts: otherwise the *teguments* reunite.

1429. The wound in question is not to be considered as a simple wound, which would only require a reunion; and indeed no one has considered it as such; for all have reserved a passage in it for the *lochia*, which rarely fail, during the first days, to be discharged that way. But can it be necessary to keep an opening of six or seven inches for the discharge of those fluids, when one much smaller may suffice? The air is inimical to the *viscera* of the *abdomen*, and we cannot preserve them from it too carefully. Besides, the intestines require to be kept soft and light, and it often happens that they are bruised by the bandage, when we endeavour to spare the woman the pain of the *suture*.

1430. It would be an abuse to multiply the stitches as some ignorant persons have done; but we ought to make two or three to unite about the superior two thirds of the length of the wound. It is sufficient, to preserve an opening of about two inches at the inferior part of it; the *uterus* being not much larger the day after the operation when that *viscus* is contracted, as it usually is after delivery. I shall not describe the manner of making this *suture*, because all surgical authors have mentioned it: I shall only observe that the knots should be tied with bows, that they may be loosened and tightened occasionally.

1431. We place oblong compresses on the sides of the wound, and a square one over it; all moistened with the white of egg beat up with water quickened with a little spirit, such as brandy, spirit of wine, or *arquebusade*. I think we ought to put two little cushions very soft at the sides, above the hips, to make the bandage steady, and force forward any fluids that

may be extravasated in the *abdomen*. The whole to be retained by a folded napkin passed round the body.

1432. This wound requires dressing oftener than any other wound penetrating the *abdomen*, in order to prevent extravasations and the formation of clots of blood which the bandage retains between the lips of the wound in the *uterus* and of the *teguments:* we must then take off the dressings every day, or even several times in the twenty-four hours, if we have occasion to suspect those extravasations, or the protrusion of the intestines or the *omentum*. But we may dress more seldom when the *lochia* have taken their natural course, and when the lower part of the external wound presents no other indication but that of reunion. The dressings ought always to be very simple, and without ointment.

1433. It would sometimes be very useful to inject warm water, or weak barley water, to cleanse the surface of the *viscera* from the *lochia*, in the neighbourhood of the wound. It would not be less advantageous to throw it into the *uterus* itself by the wound, to keep its orifice free, and dispose the *lochia* to pass that way. *Rousset*, *Verduc*, *Ruleau* and others, with the latter view, have recommended the introduction of a *canula* or species of hollow *pessary*, into the neck of the *uterus;* but besides that it would be difficult to keep the instrument there, it could not give a passage to clots, among which some are very large. The conduct of M. *Guenin* appears to me preferable, though it is not conformable to the general opinion. A woman on whom he had performed the operation nine hours before, being in a state of considerable suffocation, suffering frequent faintings, and vomiting almost every minute, he uncovered the wound and loosened the *suture*, to extract from the belly and *uterus*, the clots formed in them. He afterwards pour-

ed in warm wine, and forced it to pass into the *vagina*, by insinuating his finger through the wound into the neck of the *uterus*, to unstop it: this, says he, restored the course of the *lochia*, which had been suspended by a clot of blood. I think that sufficient attention is not paid to this article, and that by clearing the neck of the *uterus*, from time to time, the success of the Cesarean operation would be more certain. With that intent, I have used an unravelled bandage. I have been reproached for it in a work very lately published; but it has been condemned in opposition to all reason.

1434. We cannot lay down fixed rules for the rest of the treatment; because it must depend on accessory circumstances. If the woman is strong and robust, she may be bled some hours after the operation, and that evacuation may be repeated according to the nature and violence of the accidents which shall occur. The belly must be kept open, by clysters; and the patient must be kept to a strict diet and antiphlogistic drinks, such as veal or chicken broth, very weak, sharpened with a little nitre, &c.* As we can

* We should consider in this country a strict antiphlogistic regimen a very different one, from what our author points out; we should certainly and very scrupulously forbid animal broths of any kind; the stimulating quality of which is not sufficiently attended to; for I have no hesitation in believing, that were two patients every way similarly situated, to be subjected to the trial of one being indulged in broth, however weak, and the other to abstain from it, that the one using the broth where symptoms ran high might perish, while the other, with equally unfavourable previous symptoms might escape It is however to be understood, that in other respects the treatment is to be alike. I have chosen to bear this testimony against broth or animal juices here, as the operation considered in the text is confessedly one of the most serious kind, and should have every advantage from regimen, &c. that the operator can give; and the more especially is this caution

here give only general rules on the subject, it must be left to the sagacity of the surgeon to prescribe particular ones according to the exigency of the case.

1435. We ought to persuade the woman to suckle her child; unless the first accidents of the operation, or those which have preceded it, deprive her of the power of doing it. Many practitioners have already given this precept, and have supplied the suction of the child, by glasses or young puppies. That is the way to attract the milky humor towards the breasts, to withdraw it from the *uterus*, and more speedily dry up the source of the discharges which are made through the wound of that *viscus*.*

1436. After the perfect consolidation of the wound, the woman ought never to go without a proper bandage, to prevent a subsequent hernia, which happens to the greater part of those who have undergone the Cesarean operation, and which sometimes becomes of an enormous size.

necessary with respect to this article of diet, as it is but too frequently supposed to have but little effect on the system, and may be indulged in under almost any circumstance, than which, nothing can be more erroneous or injurious.

W. P. D.

* Nothing can be more visionary than the opinions the French writers have on this subject; they imagine that milk may be deposited or translated to any part of the body of a lying-in woman, hence the above caution; it must nevertheless be agreed, that the practice above recommended is good, however improbable the theory may be. May not the discharge of milk be useful as an evacuation? and also by inviting a powerful sanguine determination to a remote part, and to one that very powerfully sympathizes with the uterus? W. P. D.

Of the Causes of the Rupture of the Uterus, and the principal Accidents attending it.

1437. Most authors, in treating of the rupture of the *uterus*, have attributed it only to the extraordinary motions of the child,* without considering that many women had felt none at the time when it took place, and that in others, it had not happened till after the death of the child. Whatever force we may suppose in those motions, they will never be able to effect that rupture, unless other causes act at the same time, or have already disposed the *uterus* to it; but, on the contrary, those causes may produce it without the assistance of the child's motions. The child is almost always passive at the time the *uterus* tears; if it becomes the instrument of the rent, it acts no otherwise than any other solid body of the same volume, inanimate, and of an angular surface would, on which the *uterus* should be strongly contracted. The extraordinary movements which have been regarded as the cause of these accidents, have generally been only the consequence of them. It is not in the *uterus* that the child had moved in that manner, but in the abdominal cavity, whither it had been forced by the rupture in question: it was easy to be deceived in it; because the instant of the child's passage into the *abdomen*, and that of the rupture by which it passes, are, as I may say, indivisible, the same effort producing both.

* *De la Motte*, tom. ii. page 1189, edit. de 1775.

Levret, Art des Accouchemens, edit. 3, § 559 and following.

Crantz, Commentarius de Rupto in Partus Doloribus Fœtu Utero 1756, and many other authors.

1438. The violent and sometimes convulsive action of the *uterus* on the child's body, is almost always the only cause of its rupture; and it will take place much more certainly, if that action is assisted by that of the muscles which surround the abdominal cavity, which press the *uterus* unequally, as they cannot act in all parts immediately on its surface, and serve for a support to every point of it. Those muscles act nearly as any other power would do which should press the belly strongly, if the back were placed against a wall. It is always at the height of a pain, or of a contraction of the *uterus*, and at the time when the woman bears down the strongest to second that effort, that the rupture takes place. It is not however necessary, in order to effect it, that those united powers should act with all the force of which they are susceptible, since that accident has happened in some cases, at a time when the labour was scarcely begun: it is sufficient that that force be superior to the resistance opposed to it by the part which tears.

1439. An *uterus* perfectly sound may tear, as well as one affected by any disease which has previously weakened its tissue. If every point of its surface is so disposed as to support equally the effort which tends to expel the child, at the beginning of labour, it is not always the same at the latter end of a very long labour, when great obstacles oppose the delivery; because the substance of the *uterus* necessarily weakens in some part, and especially at those points which answer to the regular parts of the child, or which are pressed by its head against the margin of the *pelvis* and sooner or later, those parts give way.

1440. The rupture in question cannot happen in any case, unless the *uterus* has been predisposed to it by those means, or by other causes which are all accidental. Sometimes a tumor weakens the substance

of the *uterus*, and disposes it to tear; sometimes an ulceration more or less superficial, or the preternatural tenuity of one of its regions; at other times, it may proceed from indurations and callosities of its neck, or of the *vagina*, a deformity of the *pelvis*, and even from the obstacles arising from the external parts, the bad situation of the child, or of the head alone, &c.

1441. External causes may tear the *uterus*, without the assistance of all those I have just mentioned, at whatever period of pregnancy they may act, provided however that it be towards the period of its maturity. We find examples of it from a fall, from a strong pressure on the belly; and much oftener from the unskilful application of the hand, or of instruments destined to perform the delivery.

1442. There is not a single point where the *uterus* may not tear; but we observe, nevertheless, that it is generally towards its sides, the *fundus* or the neck: which is not difficult to account for. The part where the *placenta* is implanted is not more secure than the rest; and the rupture has taken place in some cases at the very part which seemed to be fortified by a scirrhous tumor with a large base. The rupture does not always follow the same direction, nor always present the same aspect. Sometimes it happens longitudinally, at other times transversely, obliquely, or in a semilunar form. Sometimes the edges are even, and it only presents the appearance of a simple bursting, or of a wound made with a cutting instrument; at other times they are unequal, as it were ragged, and it resembles a contused wound.

1443. We must distinguish these two species of rupture, from ulcerations of the *uterus* which arise from some of the causes already mentioned; as in consequence of a long and severe labour, in which

Nature had not been able to deliver herself of the child by the usual passage: whether the obstacle arose from a deformity of the *pelvis*, or from some tumor of the neck of the *uterus* and of the *vagina;* or only depended on the bad situation of the child, which had not been rectified in time: or whether those ulcerations were only the consequence of an external percussion, &c. In the former case, the place which answers to the hardest and most projecting parts of the child, those which have been long bruised by the head pressing against the margin of the *pelvis*, inflame and ulcerate, in the same manner as that which has been struck, and an opening is produced smaller or larger, very different from a simple rupture which takes place suddenly. Most frequently, before these ulcerations are formed, the *uterus* contracts adhesions with the neighbouring parts, which also ulcerate at length, and the event is different, according to the parts where those adhesions take place. When they take place before, the *fœtus* may be discharged whole, or piecemeal through the ulcer: when they are formed elsewhere, the woman's life is in more danger; because we cannot give her the same assistance.

1444. Although the rupture of the superior part of the *vagina* in the part where it is united with the *os tincæ*, has more relation to the simple rupture of the *uterus*, than to these ulcerations, it must also be distinguished from it, because it is not so dangerous as that, and because it presents different indications, considering them at the same time only relatively to delivery. These rents of the *vagina* have been frequently confounded with those which happen in the neck of the *uterus* near its insertion in that canal; because the latter have often, like them, a semilunar form, and because the *os tincæ* is entirely effaced at

the time when we discover them, and when we extract the child.

1445. The danger which threatens the woman whose *uterus* is torn, arises much less from the rupture simply considered, than from the passage of the child and the *placenta* into the abdominal cavity, and the extravasations of blood which are formed there at the same time. It is true that the child does not always go thither, nor does the *placenta* always follow it, when it passes entirely out of the *uterus;* Nature in some cases throwing it off by the usual passage. Sometimes only a single limb of the child escapes from the *uterus* through the rupture; sometimes an arm or a leg; or the two inferior extremities and the half of the *trunk;* at other times, the head alone. Although the rupture be large enough for the exit of those parts, it sometimes happens that no one passes through it; because it answers to a part of the child's surface, which is much larger still; so that it remains entirely in the *uterus*, if it cannot be expelled the natural way.

1446. The passage of the child into the *abdomen* and the extravasation of blood into that cavity, are not the only complications of the rupture of the *uterus;* the intestines floating above, sometimes insinuate themselves through the opening, into its cavity; even before the child is out of it. If they be not reduced, while the opening preserves nearly its original size, they are strangulated in it, in proportion as the *uterus* closes; because the rupture contracts and diminishes in the same proportions as the volume of that *viscus*, and the woman is destroyed by the accidents of a strangulated *hernia;* as we particularly observe in a case communicated to the Academy by M. *Percy*, the son, from his father.*

* The *hernia* was not discovered till the opening of the body; the wound in which it was strangulated was scarcely sen-

1447. The fear of being charged with unskilfulness in announcing the rupture of the *uterus*, at the instant it happened, has hindered accoucheurs who have been witnesses of it, from employing the only possible means of preserving the mother and child, much more than the opinion they held that it was essentially mortal. M. *Levret*, who, as well as many others, thought that *gastrotomy* was the only resource in such cases, seemed to doubt whether it would ever be put in practice. The mother and the child are inevitably lost, says he, when the *uterus* tears before delivery; there is no means of saving them but the section of the *abdomen* performed instantly: but, continues he, what accoucheur would be bold enough to perform it in time, and what parents would have courage enough to permit it to be executed without delay? A great number of cases attest the truth of M. *Levret's* prognostic, and there are some which no less demonstrate the necessity of recurring to the operation which he dared not recommend openly; and show that there have been surgeons so regardless of their own interest as to propose performing it instantly, and that there have been women courageous enough to submit to it.

Signs of a Rupture of the Uterus.

1448. The greater part of the predisposing causes of the rupture of the *uterus* being most frequently unknown to us during the course of labour, and that rupture not always taking place in cases where the

sible, though it had been prodigiously large, says M. *Percy* the father, who was a witness of the fact, before the contraction of the *uterus*.

most apparent of those causes render delivery impossible, it seems difficult to indicate the signs which show that accident is likely to happen, and consequently to lay down the *prophylactic* treatment.

1449. When the woman is threatened with a rupture of the *uterus* in a laborious labour, according to Doctor *Crantz*,* the belly is very prominent and tight, the *vagina* lengthened, and the orifice of the *uterus* very high; the pains are strong, leave little interval, and do not advance the delivery. M. *Levret* adds, that the pain the woman suffers, is always seated towards the middle of the epigastric region; that a last effort or violent leap succeeds to the repeated strugglings of the child, which announces its death and the rupture of the *uterus*. But these symptoms are too uncertain for us to take them for a rule. The rupture of the *uterus* has often taken place without being preceded by any of them, and has not happened in other cases where their union seemed to declare it inevitable. If we were to take them for our guide, we should sometimes trench upon the rights of Nature, by performing a delivery which she would have been able to terminate without inconvenience; we ought not to flatter ourselves, in any case, that we have prevented a rupture of the *uterus*.

1450. What those authors advance concerning the symptoms which succeed the rupture of the *uterus* and which denote it, are much more conformable to experience. At the time when it happens, say they, the woman feels an acute pain in the part itself, and shrieks suddenly; her face grows pale; she has frequent *syncopes*, and her pulse becomes small; the form of the belly changes more or less according to

* M. *Crantz*, Dissert. sur la Rupture de la Matrice, trad. Franç.

the part of the child which has escaped from the *uterus:* cold sweats succeed, with convulsions, vomiting, and other accidents, according as the child acts on this or that *viscus* of the *abdomen;* and death soon closes the scene, if we abandon the woman to her melancholy fate.

1451. But those symptoms do not characterize the rupture of the *uterus* so clearly, that we may not be deceived by them in some cases: touching demonstrates it in a much more certain manner.* When that accident precedes the opening of the membranes, the *pouch* shrinks immediately, and becomes very flaccid, though no fluid is discharged without, because it is discharged into the belly; the orifice of the *uterus* contracts, at least, unless a part of the child be engaged in it before the rupture; if the child passes entirely into the *abdomen*, the *uterus* closes and reduces itself to the size which we commonly observe after a natural labour; the motions of the child, if it be still living, are felt in a different part from that they were felt in before; lastly, we may easily distinguish its limbs by laying the hand on the woman's belly, if we search for them immediately; but the swelling and painful tension of the parts prevent it afterwards.

1452. The labour pains properly so called cease as soon as the child is entirely in the abdominal cavity, and especially if it is followed by the after-birth; but the woman feels pains of another kind, which were unknown to her before. When the effort which has torn the *uterus* has not been able to expel the child from it, the pains continue, because the *uterus*, notwithstanding its rupture, continues to contract and endeavour to get rid of it: sometimes it expels

* See the dissertation already quoted, and the works of M *Levret.*

the child the natural way, and sometimes forces it into the cavity of the belly, according as it finds one to be easier than the other. In the former case, the part which it presented advances more and more, and in the other it recedes insensibly and disappears. Sometimes also it remains in the *uterus* whose strength is exhausted, and the labour ceases. In other cases where the head has descended into the *pelvis*, or strongly engaged in the *strait*, it keeps its position there, while the rest of the body, especially the extremities, and the inferior part of the *trunk*, penetrate into the *abdomen*. The same thing has been observed after the rupture of the *vagina*.

Of the Indications presented by a Rupture of the Uterus.

1453. It would incontestably be more advantageous to prevent a rupture of the *uterus* by performing the delivery, than to wait till it happen, to terminate it afterwards; but on what grounds shall we decide to pursue a method which may also be attended with accidents, either with respect to the mother or the child, since, strictly speaking, no certain sign can indicate that the rupture in question is inevitable? The means of preventing it would consist in extracting the child by the usual passage, or by the Cesarean operation, and the latter is recommended by Doctor *Crantz* in a number of cases: he observes however that it would be entirely out of season, if the child's head were locked in the *pelvis*. I will venventure to add that it would then be contrary to every principle of humanity; as well as in those circumstances where the *pelvis* of the woman is well enough

formed to give the child a passage; since the art presents more gentle and certain resources for the mother. The Cesarean operation is not exclusively indicated but when the *pelvis* is absolutely too narrow; and then it is much less the fear of a rupture of the *uterus* which leads us to perform it, than the impossibility of terminating the delivery any other way.

1454. Bleeding, warm baths, fomentations, mucilaginous injections into the *vagina*, the incision of the neck of the *uterus* when it is hard and callous, the section of bridles in the *vagina*, &c. the application of the forceps, the extraction of the child by the feet, and by means of crotchets; and lastly, the Cesarean operation, are so many *prophylactic* methods which must be employed according to the exigency of the case.

1455. The curative method in the rupture of the *uterus* considered relatively to delivery, must not be less varied than the *prophylactic*. Though the section of the coverings of the *abdomen* is often the only resource in surgery to save the mother and child, or to rescue the former from terrible accidents, by extracting the latter, and its after-birth, as well as the blood which is extravasated; sometimes also that operation would not be less contrary to the principles of the art, than if we were to perform it on account of most of the predisposing causes of that rupture: for notwithstanding that accident, it is not always impossible to extract the child by the usual passage. *De la Motte* and others furnish examples of it, which however I do not quote to serve for models. The former turned a child searching for the feet through the rent in the *uterus*, as far as the middle of the belly whither they had penetrated; and others assure us they had brought back a child that way, which had escaped completely out of the *uterus:* which will not appear probable to

those who know how much the *uterus* closes from the moment it is emptied, and how much the rupture then loses of its extent.

1456. When the head presents after the rupture of the *uterus*, even if it should not be engaged in the *pelvis*, provided the deformity of the latter does not offer any great obstacles to it, we ought to terminate the delivery with the forceps; whatever part may have penetrated into the *abdomen*. It may easily be conceived to what danger we should expose the woman by attempting to turn a child the major part of whose *trunk* should be in the abdominal cavity, and the rest in the ruptured *uterus*. If we cannot extract it by means of the forceps, or with the crotchet when dead, *gastrotomy*, that is to say, the incision of the coverings of the belly, is as manifestly indicated as when it has been entirely forced into that cavity.

1457. The section of the coverings of the *abdomen* will not appear so indispensable after a rupture of the *vagina* as after that of the *uterus*, to extract a child which has passed entirely into the abdominal cavity,* if we attend to the difference of these two cases, with respect to the rupture itself. After the exit of the child, the rent of the *uterus* contracts in proportion to the reduction in the volume of that *viscus*, to that degree that the finger has hardly been able to penetrate it two days after it has happened, though large enough at first, to let half of the child into the *abdomen*, and the hand of the operator also: but that of the superior part of the *vagina* does not diminish in the same manner, whatever may be the contrac-

* *Saviard*, Observ. M. *Thibaut*, Journal de Médecine, tome I. 1754; M. *Chevreul* and M. *Chaussier*, Observ. communiquées à l'Acad. de Chirurgie.

tion of the *uterus*. Those who have sought for the child when it was entirely in the *abdomen*, and have extracted it by the natural passage some hours after the rupture had taken place, have doubtless taken the rupture of the *vagina* for that of the neck of the *uterus:* for it is not practicable except in the latter case. The operation which I recommend, not only for extracting the child and its after-birth from the cavity of the belly, but also to give an exit to the blood and waters which may have been extravasated there, and which cannot be discharged otherwise, is more easy to execute than the Cesarean operation properly speaking, and does not seem to be more dangerous; for on one side, we have not the *uterus* to open, and on the other, the rupture of that *viscus* is not essentially mortal. It has been done several times with success to the woman, and probably it would have had as much with respect to the child, if it had been performed immediately after the rupture of the *uterus* instead of deferring it several hours, as has been done in all those cases. M. *Thibaut des Bois*, a surgeon of the town of *Mans*, published the first example of it in 1768,* and the Academy of Surgery has since received two others much more interesting.

1458. In M. *Thibaut's* case, every thing was exceedingly well disposed, and seemed to announce a speedy deliverance, when the woman felt a sharp and very short pain towards the superior and left lateral part of the *uterus*, after which, the head which had presented favourably, disappeared. Not finding then either the child or the *placenta* in that *viscus*, M. *Thibaut* was not afraid to propose *gastrotomy*, and to demonstrate the danger of deferring it. He performed

* See the Journal de Médecine for 1768.

it, but not till after some hours; which rendered it useless to the child. The woman suffered, in a manner, nothing but the usual consequences of a common labour. *Gastrotomy*, performed twice on the same woman, by M. *Lambron*, a surgeon of *Orleans*,* was not more salutary to the child; the first time because it was not performed till eighteen hours after the rupture of the *uterus*. But the woman at the end of three weeks seemed to be nearly recovered, when a tumor of the size of a fist appeared in the hypogastric region, and seemed disposed to open, as in fact it did, four days afterwards. Notwithstanding this gangrenous abscess, out of which came eighteen worms from four to six inches long, and of the same species as were discharged at the same time, from the *anus* and *vagina*, the woman resumed her labours in the fields in six weeks from the time of the operation. Being again pregnant the following year, she suffered the same accident, the child again passed entirely into the abdomen, and M. *Lambron*, who was present, again performed the operation of *gastrotomy;* without any farther delay than what the woman demanded to receive the sacraments. The child gave signs of life during half an hour after the operation, and the subsequent symptoms were very mild. This woman became pregnant again, and was delivered naturally of a healthy child.

1459. The operation in question is not the only possible resource for a woman whose *uterus* is torn by the efforts of labour; Nature, always attentive to our preservation, sometimes saves her life, after having led her from one danger to another. But the successes which I have just quoted, no less on that ac-

† The 9th of August 1775, on the wife of *Charles Dumont*. gardener at *St. Jean de la Ruelle* near *Orleans*.

count, demonstrate the pre-eminence of the operation over those singularly rare efforts, and which would have been still most commonly fruitless, if surgery had not aided them seasonably; either by opening the abscesses which formed, or by dilating the entrance of the *sinuses* containing the child or its remains, or by extracting them.

1460. The rupture of the *uterus* does not always present one and the same indication; because the danger attending it does not always arise from one and the same cause. After having extracted the child, its after-birth, the blood and waters if any have been extravasated into the *abdomen*, it seems to require no other treatment than the wound made methodically in the Cesarean operation; because it contracts like that, and consolidates in the same manner. If a loop of intestine gets into it, it must be disengaged from it; if it is so strangulated that we cannot withdraw it, the wound must be dilated, in the same manner as the inguinal ring in a common hernia. This complication becomes much more troublesome when the child has been extracted the natural way. Though we may then push back the intestine into the *abdomen* immediately after delivering the woman, as several authors have done, and particularly *Rungius*,* how can that reduction be obtained, when the accident has been mistaken at first, and when the intestine is strictly confined in the wound of the *uterus*, as we remark in the case quoted in par. 1446. from M. *Percy?* The woman must quickly sink if we do not effect the reduction; whatever difficulties it may present, they are not above the resources of the art. I would not recommend carrying the hand armed with a bistory into the *uterus*, to enlarge the ring

* Quoted by *Heister*, Instit. de Chir. tome ii. page 137.

formed by the contracted wound, as a surgeon asserts he did with success the third day after delivery, to reduce a loop of intestine which had fallen into that *viscus* some hours before, having reduced a still larger portion at the time of delivery;* but might it not be allowed in such a desperate case to open the *abdomen* to withdraw the intestine, as was proposed by *Pigrai* for a strangulated inguinal hernia, and as has been practised by some surgeons to remove interior strangulations?

Of Compound Pregnancy; its Signs, and the Indications it presents relative to Delivery.

1461. Compound pregnancy is that which consists of several children, and the name of twins is usually given to them, without any regard to their number; though that name, strictly speaking, signifies only two; the others being *triplets*, *quadri-gemini*, &c. A pregnancy of two children is rather rare; one of three is still more so, and we hardly ever meet with quadri-gemini.

1462. These children are not always enveloped in the same membranes, nor situated in the same manner, either with respect to each other, or to the orifice of the *uterus;* which often presents particular indications relatively to delivery. Though they are sometimes contained in the same membranes, at other times only one is common to both of them, that is the *chorion*, and each twin has its separate

* A case communicated to the Academy of Surgery in 1775, by a country surgeon, and which would be extremely interesting if its circumstances were well described.

amnion: lastly, there are some who have both membranes very distinct and perfectly separate; so that each of them has its own *chorion*, its own *amnion*, *placenta* and waters.

1463. In the former case, the *chorion* and *amnion* form but one bag, in which the twins float in the same waters, and there is but one *placenta*, or else the two masses appear to form but one. This mode of being is not the most usual with twins, and we may add that it is not the most advantageous. When they are thus disposed, their cords may be entangled, and form knots upon each other during pregnancy; both children may present some of their parts together at the orifice of the *uterus* in labour, and advance at the same time, or reciprocally oppose each other's exit: which happens much seldomer than in the other cases, &c.

1464. In the second case, each twin is contained in a particular bag, formed by the *amnion* only; and those bags are covered by a common membrane. They often have but one *placenta;* and when each has its own, those masses are as it were grafted on the same base, so that we cannot extract one without the other. The twins are not bathed in the same waters; their cords cannot be entangled as in the preceding case; one of them may die, and putrefy without injuring the health of the other, as I have several times observed; they seldom present any of their parts together uncovered at the orifice of the *uterus* in labour, &c.

In the third case, each twin being contained in a particular bag, formed by the *chorion* and *amnion*, they have their *placenta* distinct; so that we might extract one of the children, and its after-birth immediately afterwards, without much inconvenience. It is in such circumstances, that accoucheurs, not sus-

pecting the existence of a second child, have involuntarily abandoned it to the care of Nature, which has often not expelled it till the next day or several days afterwards. As no sign can demonstrate before deliverance, whether the children have their *involucra* common or particular, we ought never to attempt the extraction of the after-birth till after the exit of the last child.

1465. The situation of twins, with respect to each other, or to the orifice of the *uterus*, is exceedingly various. Sometimes they are placed parallel to each other, and sometimes they cross forming angles more or less acute; one of them presenting the head, the feet, the knees, or the breech at the orifice of the *uterus*, and the other a different part; as we shall see hereafter.

Of the Signs of a Pregnancy composed of Several Children.

1466. The extraordinary size of the belly at any given period of pregnancy, its division into two tumors more or less apparent in the latter months, an *œdema* of the inferior extremities from the third or fourth month, and the motions the woman may feel in several parts at the same time, are exceedingly uncertain signs of the presence of several children. There is not one of them which we have not observed in women who were big of only one, while we have often remarked nothing of the kind in those who were really so of two. I do not however deny that the union of all these signs sometimes gives strong presumptions of the existence of twins; but touching

alone can dissipate our doubts, and that only in the last months of pregnancy.

1467. When the belly is so large as to give a suspicion of two children, if there is but one, it is always very movable; because it is then in a large quantity of water: we easily move it by means of the finger introduced into the *vagina*, and its rolling is never more manifest than when we do that. When there are two, that movement is scarcely sensible; we easily distinguish that the child we endeavour to move by touching, is surrounded by only a little fluid, and that it is incumbered by another solid body; if we apply a hand on the woman's belly in one of these moments when the *parietes* of the *uterus* are supple, and as it were slackened, we may discover those children as clearly as in other cases we distinguish the feet, the knees, or the arms of that which is single.

Of the Indications presented by Twins relative to Delivery.

1468. Though the pregnancy consist of several children, delivery may take place as naturally as if there existed but one; provided that they present successively and in a proper situation at the orifice of the *uterus*. We observe only that the expulsion of the first is generally performed with a little more difficulty than in a common labour: which doubtless is because the *uterus* does not embrace it equally in all parts, and cannot act immediately on it except on one side: for each twin is in general smaller than the child which constitutes a common pregnancy.*

* I have however seen twins, the least of which surpassed the middle size of children at full time; its head having three inches eight lines in the transverse diameter.

1469. When the first child presents well, if the head advances in the usual direction according to the position it is in, we ought to leave its expulsion to the efforts of Nature. We proceed in the same manner with respect to the second, if it should place itself as advantageously at the orifice of the *uterus*, and if the mother retain strength enough to deliver herself without help, or with only the assistance usually given in a natural labour; but when it presents badly, we ought to search for the feet and bring them down. Though it is proper to begin the operation before the *uterus* closes strongly, it is not less advantageous to wait till that *viscus* endeavours to expel it, to go on with the extraction: for it might be dangerous to empty the *uterus* suddenly, and before its own action contributed to it; as I have shown in another place. Twins do not always present so favourably for their exit, and sometimes that of the first cannot take place without assistance, though it be placed properly and its volume be moderate relatively to the *pelvis* of the mother. This is in my opinion, because the *uterus* cannot press the child equally on all sides, and because its expulsive forces are divided upon both children, so that the first is subjected to only the smallest part of them: as when the second child is placed across. See par 1475.

1470. Among the positions which twins may take, as well with respect to each other, as to the orifice of the *uterus*, I shall only distinguish the principal and those which are the most common; because they will suffice to demonstrate what the others require: besides, if I were to undertake to state them all, the greater part would escape my notice, so much may they be varied.

1471. Each twin may present the head at the entrance of the *pelvis*, but in a different manner; the

face of one being upward, downward, or on one side, at the same time that that of the other is turned in a contrary direction. Though they are sometimes placed parallel by the side of each other; at other times they cross one another obliquely; so that the head of that whose *trunk* occupies the right side of the *uterus*, rests in the left *iliac fossa*, while the right *iliac fossa* supports the head of the other, whose body occupies the left side of the *uterus*. In this case, delivery cannot take place without assistance; because the direction in which the head of each twin is pressed down, is such that neither of them can advance, and because the two heads recede from each other, turning back on the shoulders, or pressing harder against the sides of the *pelvis*. When they are parallel, that of the two heads which is nearest the middle of the entrance of the *pelvis*, may engage in it and force the other from it; but when it is got into the excavation it may also stop and remain there a long time, and even sometimes cannot be expelled from it, though small relatively to that cavity; as I have observed, and as M. *Solayres* remarked before me, as well as many others.*

* The head of one of the children forced down by the first pains to the bottom of the *pelvis*, in a woman exceedingly well formed, remained there from Wednesday morning till about five o'clock on Friday afternoon, notwithstanding the natural efforts were very strong: which induced me at that time, which was when I was first called, to extract the child with the forceps. After its exit, I found a second which presented the feet. I pass over the detail of the state into which the fruitless efforts of Nature, continued so long a time, had thrown the woman: I shall only remark that she speedily recovered, and that the children were extracted living. M. *Solayres* was a witness to a similar case: but both children were dead when he delivered the woman, and one of them was placed transversely under the other, so that they formed a cross.

1472. When both children present the head crossing each other in the manner just stated, they must be turned with the necessary precautions, and extracted by the feet. We must in that case begin with the child which is underneath; because in bringing that down, the other will remove itself from the entrance of the *pelvis*, and go towards the *fundus* of the *uterus* into the void which the first leaves as it advances. In fact, it would be very difficult in this case, to pursue any other conduct.

1473. If circumstances foreign to those I have already mentioned, require us to deliver without delay when the two children are parallel to each other, and present the head at the orifice of the *uterus*, it is of no consequence whether we begin with that which is placed at the right side of the *uterus*, or that at the left: the preference must then depend on the hand which the operator introduces into the womb. In this case, as in all those relative to twins, we must be careful to take hold of the feet which belong to the same child, that we may not bring them both down at once; and as soon as they are without, to remove from the superior strait, not only the head of the first child, but also that of the second, that they may not be entangled in the neighbourhood of that *strait*, and one be brought along by the other, which might happen, just as a knotted cord put into a bottle in order to extract a cork, hooks it and draws it out.

1474. We have seen one of the twins present the head in a favourable situation, and the other the feet. Though such a situation seems to indicate pushing back the latter, and removing them from the entrance of the *pelvis*, that the former may engage in it, experience has proved that that method would not always answer our expectations. It would often be better to

begin by extracting the child that presents the feet, taking care to prevent its breast or its head from bringing down the head of the other; as we observe in a case published in the *Journal de Médecine.**

1475. The two children may present the feet at the same time, and that case is the most favourable after that where they come without help. Sometimes also we meet with but one foot of one child at the orifice of the *uterus* and both feet of the other. In both cases it is equally necessary to be careful not to take one foot of each child, supposing them to belong to the same. We must begin then by ascertaining that the two feet belong to the child we wish to extract, and bring them down with one hand, while with the other we remove the extremities of the second, pushing them as high as possible towards one of the *iliac fossæ*. Twins may present the feet successively, that is to say, the second child after the exit of the first, as I have seen. I have also met with some who presented the breech in the same order. In another case, one of the twins presented the head, and the other the feet. (See the note on par. 1471.)

* M. *Enaux*, of the city of *Dijon*, having been called to a woman whose labour was far advanced, pulled at the child's feet, which he found in the *vagina*, and the *trunk* came along easily till he had brought down the arms; but the obstacles then obliging him to slide up his hand under the child's body, he was surprised to find that the head of a second had been drawn down below the projection of the *sacrum*. Not being able to push it back, and having again in vain attempted to extract the first child, he determined to apply the forceps to the head of the second, while an assistant raised up the body which was without towards the *pubes* of the mother. By this procedure M. *Enaux* delivered the woman of that twin first, which it seemed should have come last. He observes that the children were very small, and that the woman was only at the beginning of the ninth month of her pregnancy. See the *Journal de Médecine* for the month of November 1771.

In a fourth woman, the relation of the twins was such that they crossed each other; the first presenting the breech in the usual situation, and the second being placed across on the posterior part of the *uterus.* They as well as their mother were victims of the ignorance of a midwife who for six days had not found out that the woman was in labour; and who neither knew how to discover the situation of the first child, nor to estimate the obstacles which opposed its exit, and consequently what the natural powers which tended to expel it, could do. She had been in horrible convulsions from the evening before, when a physician took me to her house, but I only arrived in time to see her expire in that state: so that I did not deliver her till after her death of two children which were also dead. The cord, or the hand of one twin may be without, while the other presents the head or a different part, &c.

1476. When the cord of one child is without, if the head of the second is low in the *pelvis*, we ought to extract it with the forceps, especially if we suppose it likely to stay there some time; in order to turn and deliver the other as quickly as possible. But if the head were still above the *pelvis*, or if this child should present any other part, we ought first to search for the feet of that whose cord is come down; that it may suffer less from its compression. When the hand of one precedes or accompanies the head of the other and impedes its exit, we must endeavour to push it back. If the head is too far advanced for that, or if the woman finds herself unable to expel it, we must extract it with the forceps, notwithstanding the presence of the hand or the arm of the other child; but paying the necessary attention to that extremity that it may not be hurt by the instrument. We ought to begin by turning that whose hand is without, if no

part of the other be far advanced; proceeding as if there were but one child, till the feet be without: for then we must attend to the second child, and see that it be not drawn down by the first. I shall say nothing farther on the delivery of twins: the examples I have stated leaving little to be wished for concerning the rules to be followed in other cases, every accoucheur may supply them himself.

Of false Pregnancy, its Signs, and curative Indications.

1477. It is more difficult to give a good definition of false pregnancy, than to determine its species. It is a state whose symptoms have affinity enough with those of common pregnancy, to make the existence of the latter be believed, and even lead those of the profession whom the woman may consult, into error. I shall state two general species of false pregnancies, viz. one which is a consequence of conception, but whose product has degenerated, and changed its nature from the first periods; and another which seems absolutely foreign to it. The latter may be formed of water, air, blood, glairy and mucous matter, or by polypous excrescences. It receives different denominations, according to the nature of the fluid which constitutes it, as a dropsy of the *uterus*, a *tympanites*, &c.: while the substances which constitute the former species are known by the name of *mole*, or of false conception.

1478. A mole and a false conception seem to be the same thing in their principle, and I cannot see why accoucheurs have made any distinction between them. The remains of a *fœtus*, when they have been

found in these spongy masses which characterize a false conception, at most, only indicate that the child died a little later then than in other cases, and that some of its parts had been preserved from putrefaction and dissolution: for the germ of an embryo has not less existed in the others, though no traces of it may appear. All these abortive pregnancies were originally the same as those which go happily through their different periods.

1479. The *mole* does not always seem to be of the same nature, being sometimes entirely spongy, like the *placenta*, and at other times formed of a collection of little bladders filled with water and attached to a substance much like the former, which serves them for a base, and by which they adhere to the *uterus*. Each *hydatid* or bladder has its *pedicle* longer or shorter, and a great number of them hanging to the same stalk, form a kind of cluster, which has made some ignorant and inexperienced people believe that this woman had been delivered of a branch of a gooseberry tree, another of a bunch of grapes, &c. and that these productions were the effects of certain longings in the early periods of pregnancy, which they were not able to satisfy. These masses sometimes acquire so great a volume that they would fill a very large pan. I have assisted some women who had carried them till the seventh month, and others only till the third.

1480. The first species of *mole* does not essentially differ from what constitutes the *placenta* in a common pregnancy. The form of it is only a little different, and it seems less organized, because we do not find in it the *plexus* of arteries and veins, which lines the internal surface of the latter. Those who recollect the origin of those vessels and their uses, will not be surprised to find nothing of the kind in a

mole. This mass increases faster than the *placenta;* but it only enjoys a kind of vegetative life. There is no regular circulation in it; the blood it receives passes from the *sinuses* of the *uterus* into the *venous sinuses* which we find on its surface, because they are contiguous, and they pour it into the spongy substance of which it is formed. Receiving much more of that fluid than it returns to the *uterus*, it is always so gorged with it, that it detaches itself with the smallest effort; on which account, the woman often suffers irregular floodings while she carries this foreign body.

1481. These sorts of *moles* almost always have a cavity lined with membranes, which contains more or less water. Though at the time of their exit, we most frequently do not find that fluid, it is because it has been discharged before, either by transudation, or otherwise. In the former case, it is coloured by the blood which the action of the *uterus* expresses from the little cells of the *mole* which are torn. When that fluid is discharged several weeks or months before the expulsion of the *mole*, the mass rolls itself up in some measure, without detaching itself from the *uterus*, and nevertheless continues to increase. Its cavity, not very spacious at the time the waters are evacuated, vanishes or contracts so far that we no longer find it after the expulsion of the *mole* which then appears solid. The cavity, on the contrary, is very apparent when the waters are not discharged before the expulsion of the *mole*, or but a short time before it.

1482. *Moles* present also under two different aspects at the time Nature rids herself of them; being sometimes humid and very full of blood, at other times withered and their spongy substance appearing drier and closer. In the former case, they are much

larger, and their expulsion soon follows the show of blood which always precedes them. In the latter the hemorrhage manifests itself a long time before; it is moderate, and seems rather a depletion of the spongy mass, than a flooding from the *sinuses* of the *uterus*. I have attended several women who have discharged these *moles* a fortnight, a month, and even six weeks after the cessation of the red discharge. These masses were then, as it were, rolled up, and so dry, that it would have been difficult to have expressed a few drops of blood from them.

1483. The duration of these false pregnancies is uncertain; Nature rids herself sooner or later of the substances that constitute them, according to a variety of circumstances, the greater part of which may be looked upon as accidental. Though it is generally from the third to the fourth month, sometimes it is not till the sixth, the seventh, and even the ninth: it is said that some women have carried such masses for years.*

Of the Signs which characterize a false Pregnancy.

1484. There is no sign which can demonstrate with certainty before the fourth or fifth month, whether a pregnancy be true or false; because it is not till that time that the child manifests itself easily to the touch: nor can we distinguish it even then in many women. True and false pregnancy have common symptoms, which do not permit us to discriminate them in the first periods. The *menses* are gene-

* It will be understood that I speak here only of those false pregnancies which I consider as the produce of conception.

rally equally suppressed in both cases; if they sometimes appear, it is but in very small quantity, just a show, and no more. Nauseas, disgusts, &c. accompany a false pregnancy, as well as the true; the belly augments insensibly; but, according to some authors, that augmentation is more apparent in the first months, than in a good pregnancy; which however is not so constant as to allow us to draw the smallest conclusion from it. The breasts sometimes secrete a sort of milky humor, which adds its support to the other symptoms; and internal movements which women of the greatest experience take for the motions of the child, confirm them in the idea that they are really pregnant. All these symptoms may also manifest themselves, though no species of pregnancy should exist; as I have observed in several women.

1485. Touching is the only method which can lead us to the knowledge of the state of the woman; but it must not be limited to the mere application of the hands on the woman's belly, which might also, in these doubtful cases, lead us into error. I have known women who have been pronounced pregnant from touching the belly, and who were treated as such, and yet were not pregnant at all, in any way: and others who had been assured of the contrary, and nevertheless were delivered some time afterwards. One of the former was attended by one of the most eminent accoucheurs, who believed to the last moment that she was really with child, though she had only a sort of intestinal *tympanites*, which vanished four and twenty or thirty hours after I had declared she was not pregnant. The belly had augmented gradually for about nine months; the *menses* only just made a show at each period, &c. and from the fourth month, this woman had felt internal movements which had been taken for those of the child,

and which were sufficiently apparent externally, to countenance that opinion.

1486. We ought to touch the woman according to the rules already laid down, to ascertain the volume of the *uterus;* for it is the state of that *viscus* which must guide our judgment. When it is large enough to make us presume a pregnancy of four or five months, we must agitate it a little to excite that motion of the child, known by the name of rolling. The absence of that motion, especially at the period when no one can mistake it, joined to the volume of the *uterus*, characterizes a false pregnancy, when we are certain at the same time that that *viscus* is not affected by any disease. But of what nature is that false pregnancy? That is the most difficult point to determine.

1487. When a false pregnancy is formed of water, the *uterus* is heavy, and we distinguish through its substance, a fluctuation more or less deep. When it is only a *tympanites*, it is light, though equally voluminous. It is not so easy to discover a mole, and to distinguish whether it is in a mass or vesicular: the absence of the signs already stated, and of those of a true pregnancy at a time when the motions of the child should no longer be equivocal, can only lead us to suppose it to be a *mole*. We cannot infer any thing from the state of the neck of the *uterus* in favour of one of these species of false pregnancy, rather than another; for the development of that *viscus* is always performed according to the same laws, when it contains substances susceptible of growth or augmentation. A dropsy of the *ovaria*, and that of the *abdomen* itself have often deceived practitioners into an opinion of the existence of false pregnancies. Although those diseases have their characteristic signs, as well as all others, it must be allowed that it is not easy to distinguish them at the beginning.

Of the Mechanism by which the Substances which constitute the different Species of false Pregnancy are expelled; and the Assistance they require from Surgery.

1488. The denomination of false pregnancy *(fausse grossesse,)* so often used by authors, to signify that which is formed by substances which cannot be looked upon as the produce of conception, or by that produce when there exists no child, ought to have led them also to signify the exit or expulsion of those substances, by the name of *fausse-couche;* to distinguish it from an abortion, which is a delivery more or less premature.

1489. The mechanism of the expulsion of all these substances, is nearly the same in all cases, and often differs from that of common labour, only by the violence and duration of the efforts necessary to effect it. When the *uterus* contains nothing but air, water or blood, if those fluids are retained only by the contraction and closing of the orifice, they escape as soon as that contraction ceases, or when the fibres that constitute the edge of the orifice can no longer counterbalance the continual action of the distended and irritated fibres, which form the rest of that *viscus*. It is by the same cause that labour begins, and delivery is performed.

1490. Warm baths, emollient fumigations and injections, might therefore, by weakening the spring of the fibres of the neck of the *uterus*, provoke the discharge of those fluids, before the time fixed by Nature; as might also the dilatation of the orifice procured by the introduction of the finger. But the latter of these methods must not be employed except when

we are very certain of the existence of the species of false pregnancy in question. When these collections are the consequence of an obturation, either natural or accidental, of the neck of the *uterus* or of the *vagina*, we must render them pervious by means of a cutting instrument: as has been often done on account of a retention of the menstrual blood in young women, and even in those who had had children.

1491. The expulsion of a mole, and of mucous and glairy humors, which are contained in a species of cellular tissue more or less loose, or in separate cysts, does not always take place by a mechanism so simple and so easy to the woman, as the expulsion of water, of blood or air. When it is a mole, labour begins like that in a true pregnancy, and the violence of the pain the woman suffers, is in proportion to the obstacles which oppose the intentions of Nature. This labour is preceded by a sensation of heaviness and lassitude in the limbs, &c. and the greater part of its symptoms resemble those of the true labour of childbirth: the body of the *uterus* hardens at each pain, as in that, and afterwards relaxes; the neck is, at length, effaced, the orifice dilates insensibly, and the substances in question engage in it and clear it, in the same manner as the child does.

1492. The expulsion of a mole must be entirely confided to Nature, when the woman loses but little blood; but the accoucheur must extract it when the flooding is abundant; proceeding for that purpose as in delivering the after-birth after an abortion. *See* the article on delivering the after-birth.

Of the Causes of Abortion, and its Symptoms.

1493. Abortion is the expulsion of a child before the usual period of pregnancy, and especially before that in which it is strong enough and sufficiently developed to live after its birth.

1494. A great number of causes may produce abortion. Sometimes it is the consequence of acute or chronical diseases, which affect the woman during pregnancy; of a sanguine plethora, or a want of food; of a cough, or straining to vomit; of a stiffness in the fibres of the *uterus*, which cannot yield and develop themselves sufficiently; of some tumor which affects that *viscus*, of its extreme sensibility, or of its weakness; of a violent passion, of a sudden fright, or an external percussion, by a blow, a fall, &c. At other times it depends on the state of the child, on its diseases, or its death; on affections of the *placenta*, its insertion over the neck of the *uterus*, &c. I shall not enter here into the mode in which all these occasional causes of abortion act, because the explication of them should seem more properly to belong to a treatise on the diseases of women and children, than to this.

1495. The greater part of these causes may produce an abortion at any period of pregnancy indifferently; and the others do it pretty constantly at the same period in the same woman, but in some sooner, in others later. I know women who have never carried a child beyond the third month; others the fourth, fifth, or sixth, without being influenced by any apparent cause. So many abortions seem to have been only a consequence of the extreme sensibility of the *uterus*, and of the rigidity of its fibres which could

not extend beyond a given point, without being violently irritated, and without contracting. I have also observed that other women, after having miscarried several times at one of the stated periods, have carried their children a little longer in the subsequent pregnancies, and have at last gone nearly the usual time, by employing the precautions necessary to diminish the sensibility of the *uterus*, relax its fibres, and dispose them to a more considerable extension.

1496. Though abortion sometimes happens without any apparent cause producing it, and without being announced by any precursive symptom, at other times the woman suffers troublesome pains towards the loins and in the *uterus*, accompanied by a sensation of heaviness at the bottom of the belly, a long time before; and it is often preceded by a flooding, sometimes moderate, sometimes abundant, according to the cause which has determined it.

1497. The consequences of abortion are more or less disagreeable to the mother and child, according to the nature of the cause which provokes it, the force with which it acts, and the derangement it produces in the functions. Abortion is not dangerous in itself; it takes place by a mechanism similar to that of common labour, and its subsequent symptoms differ little from those of the latter. Among the children who are born before the period of the seventh month, some are dead before their exit, and the greater part of the others die soon afterwards. It has however been asserted that some have been preserved who came at six months, five, and even four and a half, and that, notwithstanding the weakness and imperfection naturally attached to those periods, they have lived to an extreme age. Such examples, supposing the women were not deceived in their reckoning, are too rare and too extraordinary, for us to flatter our-

selves we should be able to preserve children born at these latter periods, whatever care we might take of them: we must not however abandon them, nor neglect that care.

Indications in Cases of Abortion.

1498. We might often prevent abortion, if we were perfectly acquainted with its cause, even when the labour of it is already begun. A very plethoric woman felt the pains of child-birth towards the seventh month of her pregnancy, and the labour was very far advanced when I was called to her assistance; since the orifice of the *uterus* was then larger than a half-crown. Two little bleedings at the arm restored a calm, so much that the next day, the orifice in question was closed again, and the woman went the usual time. Food of easy digestion prudently administered, quieted a labour not less advanced in another woman, where it was suspected to be the consequence of a total privation of every species of nourishment for several successive days: delivery did not take place till two months and a half afterwards, and at full time. Emollient clysters, and a very gentle cathartic, procured the same advantage to a third woman, in whom the labour pains came on between the sixth and seventh month of pregnancy, after a colic of several days' continuance, accompanied with a diarrhœa and tenesmus, &c. &c. &c.

1499. If such means have been employed with so much success in cases where abortion seemed on the point of taking place, with more reason ought we to expect good effects from them, when the cause that tends to provoke it has not yet exerted its action on

the *uterus* to that extreme degree. I know women who have not carried their children the full time, till after they had miscarried three or four times, at six weeks, two, three, and four months, and who have been indebted for that advantage entirely to bleeding at the arm, performed a few days after the first time the *menses* had failed to appear, and repeated during the course of pregnancy as soon as the smallest symptom of plethora was perceived. Bleeding is not less advantageous to those women in whom the sensibility of the *uterus*, its spasmodic contractions, the stiffness of its fibres, &c. have frequently occasioned abortion, than to those of a sanguine constitution. Diluting drinks, such as veal or chicken water;* and especially the warm bath must not be neglected in those cases. In women attacked with convulsions which depend only on those same causes, antispasmodics succeed the best; it is often important to begin the use of them betimes, and continue them to the end of gestation. We must proceed differently when the weakness of the woman is the cause of abortion; in that case, we must be sparing of her blood, prescribe rest, and endeavour to strengthen her.

1500. When the labour of an abortion is so far advanced that the pains are strong, the orifice of the *uterus* dilated, and there is no longer any hope of calming it, we must conduct ourselves according to circumstances. The expulsion of the child, as well as of the *placenta* must be left to Nature, when no other accident attends it; because she delivers herself of both in the same manner as at the usual epoch of labour. In the first two or three months of pregnancy, Nature expels the whole produce of conception at

* This is surely inadmissible where plethora or fever exists. W. P. D.

once, unless under the vain pretence of assisting her, we open the membranes. The labour is easier to her in that way, than if the waters of the *fœtus* were to be discharged first. But we observe the contrary after that period; then the waters drain off sooner or later, the *fœtus* is delivered next, and the *placenta* is not expelled till the last.*

1501. We ought therefore to avoid tormenting and fatiguing the woman by touching her too frequently in the course of an abortive labour, when it takes place in the first two or three months of pregnancy; and more particularly opening the membranes with a view of accelerating the exit of all the contents of the *uterus:* for that is the way to retard their expulsion and prolong the labour. The *uterus* being lightened by the discharge of the waters of part of the load which incommoded it, contracts for a time with much less vigour; its action weakens, and often does not become brisk again for a long time.

1502. When abortion takes place at a more advanced period, besides the accidental circumstances which may complicate the labour of it, and prescribe particular indications, we must attend also to the situation of the child, or the manner in which it presents; for it cannot always come without help, especially after the sixth month. We therefore proceed

* I have seen several cases where an intense flooding has been kept up by the *placenta* being partially engaged in the mouth of the *uterus*, and which would, I have no doubt, have proved fatal, had not this mass been removed. For this purpose I employ a firm piece of iron wire bent at one extremity like a crotchet, its end made very smooth and blunt; the other end may be turned in such a manner as to serve for a handle. The small end is then carefully introduced into the mouth of the *uterus* and made to reach to the *fundus:* it is then gently drawn downwards, by which means we hook the *placenta* and draw it out. The flooding immediately ceases, and the woman is rescued from threatening danger. W. P. D.

in that respect, and in all cases where any accidents occur, as if the woman were at full time; or else in the manner laid down in the article which treats of the delivery of the after-birth, after an abortion. The subsequent symptoms in all these species of abortion being nearly the same as after the delivery at full time, the regimen the woman ought to observe should be the same in both cases.

THE END.